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# 1996 *Annual Report*



*Michigan Agricultural  
Experiment Station  
Michigan State University*



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# 1996

## *Annual Report*



*Michigan Agricultural Experiment Station  
109 Agriculture Hall  
Michigan State University  
East Lansing, MI 48824-1039  
517-355-0123*

Report prepared under the direction of J. Ian Gray, director of the Michigan Agricultural Experiment Station, and  
Debbie McCaffrey, administrative assistant.

Design by Christine Altese; editing and production by Jamie DePolo, information officer,  
Outreach Communications. All photos by Kurt Stepnitz, MSU photographer, except as indicated.

# 1996: Continuing the tradition of excellence in agriculture and natural resources research

In 1996, the Michigan Agricultural Experiment Station at Michigan State University honored a retiring director, welcomed a new director and continued to maintain its commitment to meeting the agricultural and natural resources research needs of the state's people.

■ Robert G. Gast, associate vice provost and director of the MAES since 1983, retired from his MAES position when he was named acting vice president for research and graduate studies in December 1995. Gast was cited by MSU President Peter McPherson for his fiscally responsible leadership and his track record of aggressively promoting and administering research programs.



J. Ian Gray, food science and human nutrition researcher and MAES associate director since 1988, was named director in July 1996. Gray had served as acting director since December 1995. While serving as associate director, he worked closely with director Gast in all facets of the operation and had

special responsibility for handling the regional research program. He also developed and maintained strong ties between research and commodity groups and worked with USDA and MAES researchers to handle special grants.

Frank D'Itri, fisheries and wildlife researcher and associate director of the Institute of Water Research, was named to a half-time position as acting assistant director of the MAES in February. In 1993, D'Itri was chosen to participate in the national administrative leadership development course sponsored by the Experiment Station Committee on Organization and Policy. During his internship, he participated in a yearlong in-residence project that gave him experience with the day-to-day workings of the MAES.

Janet Bokemeier, sociology researcher, was named half-time assistant director in October. Bokemeier is involved in all aspects of MAES administration and has special responsibility as liaison to researchers in the behavioral sciences.

■ Though budgets remained tight, the MAES enjoyed a productive year. The programmatic, staffing and facilities phases of the Revitalization of Animal Agriculture in Michigan Initiative are underway. The Animal Industry Coalition is overseeing distribution of these funds. Most of the research, teaching and outreach positions have been filled. The scientists are making contact and working with commodity groups around the state and have started a number of research projects. The Infectious Disease Containment Facility and the Equine Teaching and Research Center were completed in 1995, and the new Pavilion for Agriculture and Livestock Education opened in October 1996. All available dates in the pavilion are already reserved for events. The renovations to Anthony Hall, the Meats Laboratory and the Dairy Plant should be completed by 1997.

■ In personnel matters, Lonnie King was appointed dean of the College of Veterinary Medicine after Waldo Keller retired. George Leroi was named dean of the College of Natural Science. He had been serving as acting dean. Kirk Heinze was named acting chairperson of the Department of Agricultural and Extension Education after Carroll "Jake" Wamhoff retired. Mark Uebersax was appointed interim chairperson of the Department of Food Science and Human Nutrition after P. Vincent Hegarty accepted an appointment as director of the Food Industry Institute. Linda Good became acting chairperson of Human Environment and Design after Dawn Pysarchik returned to the faculty. Cynthia Fridgen was named chairperson of Resource Development. She had been serving as interim chairperson. Michael Klug was named director of Kellogg

Biological Station. He had been serving as acting director. Mary Harvey was named acting director of Outreach Communications after Maxine Ferris retired. Richard Groop was appointed coordinator of the Center for Remote Sensing after the center was moved administratively from the College of Agriculture and Natural Resources to the College of Social Science and affiliated with the Department of Geography.

■ Reallocated and new state funding was used to target pesticide crisis areas in Michigan. Eight research projects have been funded so far, including a pesticides at risk (PAR) data base, which identifies the specialty crops in Michigan that are likely to be affected by the loss of critical pesticides in the next three years. The data base is a dynamic instrument that can be updated readily. The updates will be funded jointly by the MAES and MSU Extension.

Output from the data base provides an objective means of ranking the risk of loss of a pesticide for a particular crop. A specialty crop pesticide loss assessment team, made up of MAES scientists and MSUE specialists from a range of disciplines, takes this output and produces a crop by pesticide risk rating. The risk rating has assisted the MAES in establishing funding priorities for short-term research goals that address losses of critical pesticides.

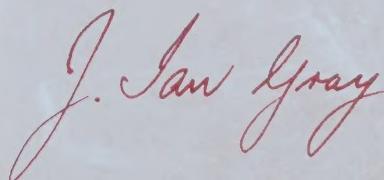
Producers, specialty crop commodity groups, Michigan Farm Bureau and MSU have developed a plan to address long-term research and extension needs in the plant initiative proposal, Generating Research and Extension to meet Economic and Environmental Needs (GREEN).

■ To assess all aspects of the state's agriculture and natural resources industries, the MAES initiated two projects, the Status and Potential of Michigan Agriculture (SAPMA) and the Status and Potential of Michigan Natural Resources (SAPMINR). The nine research

projects funded through the SAPMA project are completed and a report discussing the projects and their impacts will be published in 1997. The 10 interdisciplinary projects funded through the SAPMINR project are in their second year of research.

- Five disciplinary grant projects were completed this year. The results were presented in a series of seminars sponsored jointly by the MAES and the researchers' academic departments.
- 1996 was a difficult year for plant agriculture, especially wheat production. Working in conjunction with MSUE, the MAES published a series of "Wheat Alerts" to help wheat growers manage the state's severe scab outbreak. The MAES continues to fund research in this area.

The new year will bring another set of opportunities and challenges to Michigan's agriculture and natural resources industries. With new leaders committed to identifying and solving the problems of Michigan's citizens, the Michigan Agricultural Experiment Station is uniquely positioned to meet these challenges and opportunities and keep Michigan competitive in the 21st century.



J. Ian Gray, Director

Michigan Agricultural Experiment Station

# *Michigan Agricultural Experiment Station*

As of 11-1-96

**J. Ian Gray**, Associate Vice Provost and Director

**Janet L. Bokemeier**, Assistant Director

**Doreen K. Woodward**, Assistant Director

**Debbie McCaffrey**, Administrative Assistant

**Barbara Bird**, Support Staff

**Martha Lovejoy**, Support Staff

**Nan Judy**, Support Staff

**Isidra Pérez**, Support Staff



## *MAES Affiliated Deans*

As of 10-1-96

**Fred L. Poston**, Vice Provost and Dean  
College of Agriculture & Natural Resources

**Julia R. Miller**, Dean  
College of Human Ecology

**George E. Leroi**, Dean  
College of Natural Science

**Kenneth E. Corey**, Dean  
College of Social Science

**Lonnie J. King**, Dean  
College of Veterinary Medicine

# MAES Unit Administrators

As of 12-1-96

**Kirk L. Heinze**, Acting Chairperson  
Agricultural & Extension Education

**Larry G. Hamm**, Chairperson  
Agricultural Economics

**Robert D. von Bernuth**, Chairperson  
Agricultural Engineering

**Maynard G. Hogberg**, Chairperson  
Animal Science

**William L. Smith**, Chairperson  
Biochemistry

**Gustaaf A. de Zoeten**, Chairperson  
Botany & Plant Pathology

**Boyd G. Ellis**, Chairperson  
Crop & Soil Sciences

**J. Mark Scriber**, Chairperson  
Entomology

**Marjorie J. Kostelnik**, Chairperson  
Family & Child Ecology

**William W. Taylor**, Chairperson  
Fisheries & Wildlife

**Mark A. Uebersax**, Interim Chairperson  
Food Science & Human Nutrition

**Daniel E. Keathley**, Chairperson  
Forestry

**René C. Hinojosa**, Chairperson  
Geography

**Wayne H. Loescher**, Chairperson  
Horticulture

**Linda K. Good**, Acting Chairperson  
Human Environment & Design

**Michael J. Klug**, Director  
Kellogg Biological Station

**C. Gerald Haarer**, Director  
Land Management

**Frederik J. Derksen**, Chairperson  
Large Animal Clinical Sciences

**Jerry B. Dodgson**, Chairperson  
Microbiology

**Mary E. Harvey**, Acting Director  
Outreach Communications

**Bruce R. Harte**, Director  
School of Packaging

**Joseph D. Fridgen**, Chairperson  
Park, Recreation & Tourism Resources

**Charles D. Mackenzie**, Chairperson  
Pathology

**Robert M. Hollingworth**, Director  
Pesticide Research Center

**William S. Spielman**, Chairperson  
Physiology

**Kenneth Keegstra**, Director  
MSU-DOE Plant Research Laboratory

**Richard E. Groop**, Coordinator  
Center for Remote Sensing

**Jon F. Bartholic**, Director  
Institute for Water Research

**Cynthia C. Fridgen**, Chairperson  
Resource Development

**Christopher K. Vanderpool**, Chairperson  
Sociology

*Michigan Agricultural Experiment Station*

# *Outlying Stations — 10-1-96*

7

## **1. CLARKSVILLE HORTICULTURAL EXPERIMENT STATION**

*Established 1974*  
 9302 Portland Road  
 Clarksville, MI 48815  
 Phone: (616) 693-2193  
 FAX: (616) 693-2317  
 Gerald Skeltis  
*Farm Manager*  
 Phil Schwallier  
*Coordinator*  
 Case DeYoung  
*Horticulturist*

## **2. DUNBAR FOREST EXPERIMENT STATION**

*Established 1925*  
 13674 S. Scenic Drive  
 Sault Ste. Marie, MI 49783  
 Phone: (906) 786-1575  
 Ray Miller  
*Nonresident Forester*

## **3. W.K. KELLOGG BIOLOGICAL STATION**

*Established 1928*  
 3700 E. Gull Lake Drive  
 Hickory Corners, MI 49060  
 Phone: (517) 353-9445  
 FAX: (616) 671-2351  
 Bernie Knezek (517) 353-4569  
*Director, Agricultural Programs*  
 Mike Klug (616) 671-2341  
*Director, Programs and Development*

## **4. W.K. KELLOGG EXPERIMENTAL FOREST**

*Established 1932*  
 7060 N. 42nd Street  
 Augusta, MI 49012  
 Phone: (616) 731-4597  
 FAX: (616) 731-4597  
 Greg Kowalewski  
*Resident Forester*

## **5. LAKE CITY EXPERIMENT STATION**

*Established 1928*  
 5401 W. Jennings Road  
 Lake City, MI 49651  
 Phone: (616) 839-4608  
 Doug Nielsen  
*Farm Manager*

## **6. MONTCALM RESEARCH FARM**

*Established 1966*  
 4747 McBrides Road  
 Lakeview, MI 48850  
 Phone: (517) 365-3473  
 Richard Crawford  
*Research Technician*

## **7. MUCK SOILS RESEARCH FARM**

*Established 1941*  
 Rt. 3  
 9370 E. Herbison Road  
 Laingsburg, MI 48848  
 Phone: (517) 641-4062  
 Ron Gnagey  
*Farm Manager*

## **8. NORTHWEST MICHIGAN HORTICULTURAL RESEARCH STATION**

*Established 1979*  
 6686 S. Center Highway  
 Traverse City, MI 49684  
 Phone: (616) 946-1510  
 FAX: (616) 946-1404  
 James Nugent  
*Coordinator*  
 Bill Klein  
*Farm Manager*

## **9. FRED RUSS FOREST EXPERIMENT STATION**

*Established 1942*  
 20673 Marcellus Highway  
 Decatur, MI 49045  
 Phone: (616) 782-5652 or  
 (616) 731-4597  
 Greg Kowalewski  
*Nonresident Forester*

## **10. SAGINAW VALLEY BEAN AND BEET RESEARCH FARM**

*Established 1971*  
 3066 S. Thomas Road  
 Saginaw, MI 48603  
 Phone: (517) 781-1160  
 FAX: (517) 781-5282  
 Paul Horny  
*Farm Manager*

## **11. SOUTHWEST MICHIGAN RESEARCH AND EXTENSION CENTER**

*Established 1987*  
 1791 Hillandale Road  
 Benton Harbor, MI 49022  
 Phone: (616) 944-1477  
 FAX: (616) 944-3106  
 James Ertman  
*Farm Manager*  
 Thomas Zabadal  
*Coordinator*

## **12. TREVOR NICHOLS RESEARCH COMPLEX**

*Established 1967*  
 6237 124th Avenue  
 Fennville, MI 49408  
 Phone: (616) 561-5040  
 FAX: (616) 561-5314  
 Matthew Daly  
*Farm Manager*

## **13. UPPER PENINSULA EXPERIMENT STATION**

*Established 1899*  
 102 University Drive  
 Chatham, MI 49816  
 Phone: (906) 439-5114  
 FAX: (906) 439-5698  
 Paul Naasz  
*Operations Supervisor*

## **14. UPPER PENINSULA TREE IMPROVEMENT CENTER**

*Established 1986*  
 6005 J Road  
 Escanaba, MI 49829  
 Phone: (906) 786-1575  
 FAX: (906) 786-9370  
 Ray Miller  
*Resident Forester*

## **\* EAST LANSING FIELD RESEARCH FACILITIES**

*Established 1888*  
 109 Agriculture Hall  
 East Lansing, MI 48824-1039  
 Phone: (517) 355-3272  
 FAX: (517) 353-5406  
 C. Gerald Haarer  
*Director, Land Management*

# *Alphabetical List of MAES Scientists*

As of 10-1-96

Faculty members with dual MAES appointments are listed in both of the departments in which they serve.

NAME	DEPARTMENT	NAME	DEPARTMENT
Adams, Gerard C.	Botany and Plant Pathology	Busch, Lawrence M.	Sociology
Allen, Michael	Animal Science	Bush, Guy L.	Kellogg Biological Station
Allison, Richard F.	Botany and Plant Pathology	Buskirk, Daniel	Animal Science
Anderson, Sharon J.	Crop and Soil Sciences	Cameron, Arthur C.	Horticulture
Aulerich, Richard J.	Animal Science	Campa, Henry III	Fisheries and Wildlife
Ayers, George S.	Entomology	Carlson, William H.	Horticulture
Bagdasarian, Michael	Microbiology	Cash, Jerry N.	Food Science and Human Nutrition
Baker, John C.	Large Animal Clinical Sciences	Champness, Wendy C.	Microbiology
Bakker-Arkema, Fred W.	Agricultural Engineering	Chenoweth, Wanda L.	Food Science and Human Nutrition
Balander, Richard J.	Animal Science	Chou, Karen	Animal Science
Banks, Bobby D.	Animal Science	Christenson, Donald R.	Crop and Soil Sciences
Bates, Ronald O.	Animal Science	Coe, Paul H.	Animal Science
Batie, Sandra S. <sup>1</sup>	Agricultural Economics	Cook, Robert M.	Animal Science
Beaudry, Randolph M.	Horticulture	Coon, Thomas G.	Fisheries and Wildlife
Beede, David <sup>5</sup>	Animal Science	Copeland, Lawrence O.	Crop and Soil Sciences
Bell, Thomas G.	Pathology	Coussens, Paul M.	Animal Science
Bence, James R. <sup>6</sup>	Fisheries and Wildlife	Crawford, Eric W.	Agricultural Economics
Bennink, Maurice R.	Food Science and Human Nutrition	Crum, James L.	Crop and Soil Sciences
Benson, Margaret	Animal Science	Dazzo, Frank B.	Microbiology
Berglund, Kris A.	Agricultural Engineering	Dazzo, Frank B.	Crop and Soil Sciences
Bickert, William G.	Agricultural Engineering	de Bruijn, Frans J.	Microbiology
Biernbaum, John A.	Horticulture	de Bruijn, Frans J.	Plant Research Laboratory
Bingen, R. James	Resource Development	Dennis, Frank G., Jr.	Horticulture
Bird, George W.	Entomology	Dersch, Eckhart	Resource Development
Black, J. Roy	Agricultural Economics	DiFonzo, Christina D.	Pesticide Research Center
Bokemeier, Janet L.	Sociology	Dickmann, Donald I.	Forestry
Bond, Jenny T.	Food Science and Human Nutrition	Diers, Brian W.	Crop and Soil Sciences
Booren, Alden M.	Food Science and Human Nutrition	Dilley, David R.	Horticulture
Bourquin, Leslie D.	Food Science and Human Nutrition	Douches, David S.	Crop and Soil Sciences
Boyd, Stephen A.	Crop and Soil Sciences	Doumit, Matthew E.	Animal Science
Breznak, John A.	Microbiology	Doumit, Matthew E.	Food Science and Human Nutrition
Bristow, Catherine	Entomology	Downes, Theron W.	Packaging
Bronstein, Daniel A.	Resource Development	Dukelow, W. Richard	Animal Science
Brook, Roger C.	Agricultural Engineering	Dukelow, W. Richard	Physiology
Bucholtz, Herbert F.	Animal Science	Edens, Thomas C.	Resource Development
Bukovac, Martin J.	Horticulture	Edens, Thomas C.	Entomology
Burkhardt, Thomas H.	Agricultural Engineering	Eicher, Carl K.	Agricultural Economics
Bursian, Steven	Animal Science	Epperson, Bryan K.	Forestry
Burton, Jeanne L.	Animal Science	Erskine, Ronald J.	Large Animal Clinical Sciences
Burton, Zachary F.	Biochemistry	Ewart, Lowell C.	Horticulture



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NAME	DEPARTMENT	NAME	DEPARTMENT
Ferris, John N.	Agricultural Economics	Holland, Margo S.	Pathology
Ferris, Theodore A.	Animal Science	Holland, Robert E.	Large Animal Clinical Sciences
Flore, James A.	Horticulture	Hootman, Seth R.	Physiology
Fogwell, Ralph L.	Animal Science	Howell, Gordon S.	Horticulture
Foster, Eunice F.	Crop and Soil Sciences	Hull, Jerome, Jr.	Horticulture
Fraker, Pamela J.	Biochemistry	Iezzoni, Amy F.	Horticulture
Freed, Russell D.	Crop and Soil Sciences	Imig, David R.	Family and Child Ecology
Fried, Jeremy S.	Forestry	Ireland, James J.	Animal Science
Fulbright, Dennis W.	Botany and Plant Pathology	Jacobs, Lee W.	Crop and Soil Sciences
Gage, Douglas A.	Biochemistry	Jarosz, Andrew M.	Botany and Plant Pathology
Gage, Stuart H.	Entomology	Johnson, Nan E.	Sociology
Garling, Donald L.	Fisheries and Wildlife	Jones, Alan L.	Botany and Plant Pathology
Gerrish, John B.	Agricultural Engineering	Kaguni, Jon M.	Biochemistry
Giacin, Jack R.	Packaging	Kakela, Peter J.	Resource Development
Giesy, John P.	Fisheries and Wildlife	Kamdem, Donatien-Pascal	Forestry
Gomez-Duran, Charles O.	Large Animal Clinical Sciences	Kaneene, John B.	Large Animal Clinical Sciences
Grafius, Edward J.	Entomology	Keefe, Dennis R.	Family and Child Ecology
Grumet, Rebecca	Horticulture	Keith, Joanne G.	Family and Child Ecology
Guyer, Daniel E.	Agricultural Engineering	Kells, James J., Jr.	Crop and Soil Sciences
Hammerschmidt, Raymond	Botany and Plant Pathology	Kelly, James D.	Crop and Soil Sciences
Hancock, James F.	Horticulture	Kelly, John F.	Horticulture
Hanson, Eric J.	Horticulture	Kielbaso, Julian J.	Forestry
Hanson, Steven D.	Agricultural Economics	Kindel, Paul K.	Biochemistry
Harkema, Jack	Pathology	Klug, Michael J.	Microbiology
Harris, Craig K.	Sociology	Knezek, Bernard D.	Crop and Soil Sciences
Harsh, Stephen B.	Agricultural Economics	Koontz, Stephen R.	Agricultural Economics
Hart, James B., Jr.	Forestry	Kroos, Lee R.	Biochemistry
Hart, L. Patrick	Botany and Plant Pathology	Landis, Douglas A.	Entomology
Harwood, Richard R. <sup>2</sup>	Crop and Soil Sciences	Lantagne, Douglas O.	Forestry
Hausbeck, Mary K.	Botany and Plant Pathology	Lee, Julian J. L.	Packaging
Hausinger, Robert P.	Microbiology	Leefers, Larry A.	Forestry
Hausinger, Robert P.	Biochemistry	Leep, Richard H.	Crop and Soil Sciences
Hawkins, David R.	Animal Science	Lenski, Richard E. <sup>3</sup>	Crop and Soil Sciences
Hayes, Daniel B. <sup>6</sup>	Fisheries and Wildlife		
Heins, Royal D.	Horticulture		
Heinze, Kirk L.	Ag and Extension Education		
Helperich, William G.	Food Science and Human Nutrition		
Herdt, Thomas H.	Large Animal Clinical Sciences		
Hernandez, Ruben J.	Packaging		
Herner, Robert C.	Horticulture		
Hesterman, Oran B.	Crop and Soil Sciences		
Hill, Gretchen M.	Animal Science		
Hoehn, John P.	Agricultural Economics		
Hoerr, Sharon M.	Food Science and Human Nutrition		
Holecek, Donald F.	Park, Recreation and Tourism Resources		

NAME	DEPARTMENT	NAME	DEPARTMENT
Levine, S. Joseph	Ag and Extension Education	Preiss, Jack	Biochemistry
Linz, John E.	Food Science and Human Nutrition	Price, James F.	Food Science and Human Nutrition
Liu, Jianguo <sup>6</sup>	Fisheries and Wildlife	Prince, Harold H.	Fisheries and Wildlife
Lloyd, James W.	Agricultural Economics	Propst, Dennis B.	Park, Recreation and Tourism Resources
Loudon, Theodore L.	Agricultural Engineering		Human Environment and Design
Maes, Roger K.	Microbiology	Pysarchik, Dawn	Entomology
Manthy, Robert S.	Forestry	Raikhel, Alexander S.	Forestry
Mao, Ivan Ling	Animal Science	Ramm, Carl W.	Botany and Plant Pathology
Martin, Laura L.	Agricultural Economics	Ramsdell, Donald C.	Microbiology
McCullough, Deborah G.	Entomology	Reddy, C. Adinarayana	Crop and Soil Sciences
McDonough, Maureen H.	Forestry	Renner, Karen A.	Agricultural Economics
McGroarty, Estelle J.	Biochemistry	Ricks, Donald J.	Crop and Soil Sciences
McNabb, Clarence D.	Fisheries and Wildlife	Rieke, Paul E.	Animal Science
Melakerberhan, Haddish	Entomology	Ritchie, Harlan D.	Crop and Soil Sciences
Merritt, Richard W.	Entomology	Ritchie, Joe T. <sup>4</sup>	Crop and Soil Sciences
Merva, George E.	Agricultural Engineering	Robertson, G. Phillip	Crop and Soil Sciences
Miller, James R.	Entomology	Robinson, Norman E.	Large Animal Clinical Sciences
Mokma, Delbert L.	Crop and Soil Sciences	Robison, Lindon J.	Agricultural Economics
Moline, Waldimar J.	Crop and Soil Sciences	Rochin, Refugio L.	Agricultural Economics
Myers, Robert S.	Agricultural Economics	Rogers, John N. III	Crop and Soil Sciences
Nair, Muraleedharan G.	Horticulture	Romsos, Dale R.	Food Science and Human Nutrition
Nelson, Charles M.	Park, Recreation and Tourism Resources	Rook, Joseph S.	Large Animal Clinical Sciences
Ng, Perry K. W.	Food Science and Human Nutrition	Rosenbaum, Rene P.	Resource Development
Nielsen, Brian D.	Animal Science	Rozeboom, Dale	Animal Science
Norris, Patricia E.	Agricultural Economics	Rust, Steven	Animal Science
Norris, Patricia E.	Resource Development	Safir, Gene R.	Botany and Plant Pathology
Oehmke, James F.	Agricultural Economics	Sawyer, Carol A.	Food Science and Human Nutrition
Ofoli, Robert Y.	Food Science and Human Nutrition	Schabenberger, Oliver	Crop and Soil Sciences
Ohlrogge, John B.	Botany and Plant Pathology	Schemmel, Rachelle A.	Food Science and Human Nutrition
Olsen, Larry G.	Pesticide Research Center	Schiamborg, Lawrence R.	Family and Child Ecology
Orth, Michael	Animal Science	Schindler, Melvin S.	Biochemistry
Osburn, Wesley N.	Food Science and Human Nutrition	Schmid, A. Allan	Agricultural Economics
Osburn, Wesley N.	Animal Science	Schmidt, Thomas M.	Microbiology
Padgett, George A.	Pathology	Schroeder, Joseph J.	Food Science and Human Nutrition
Patterson, Jon S.	Pathology	Schultink, Gerhardus	Resource Development
Paul, Eldor A.	Crop and Soil Sciences	Schutzki, Robert E.	Horticulture
Penner, Donald	Crop and Soil Sciences	Schwab, Gerald D.	Agricultural Economics
Perry, Ronald L.	Horticulture	Schwarzeweller, Harry K.	Sociology
Person, Howard L.	Agricultural Engineering	Schweikhardt, David B.	Agricultural Economics
Pestka, James J.	Food Science and Human Nutrition	Sears, Barbara B.	Botany and Plant Pathology
Peterson, H. Christopher	Agricultural Economics	Sears, Phillip	Large Animal Clinical Sciences
Peyton, R. Benny	Fisheries and Wildlife	Segerlind, Larry J.	Agricultural Engineering
Pierce, Francis J.	Crop and Soil Sciences	Shaffer, James D.	Agricultural Economics
Potter-Witter, Karen L.	Forestry	Singh, Sher Paul	Packaging
		Sink, Kenneth C.	Horticulture

NAME	DEPARTMENT	NAME	DEPARTMENT
Slocum, Ann C.	Human Environment and Design	Weber, Michael T.	Agricultural Economics
Smith, Denise M.	Food Science and Human Nutrition	Whalon, Mark E.	Entomology
Smitley, David R.	Entomology	Whims, Fred R.	Ag and Extension Education
Smucker, A.J.M.	Crop and Soil Sciences	Widders, Irvin E.	Horticulture
Song, Won O.	Food Science and Human Nutrition	Wilkinson, Robert H.	Agricultural Engineering
Sontag, M. Suzanne	Human Environment and Design	Winterstein, Scott R.	Fisheries and Wildlife
Soranno, Patricia A.	Fisheries and Wildlife	Witter, Scott G.	Resource Development
Srivastava, Ajit K.	Agricultural Engineering	Yokoyama, Melvin T.	Animal Science
Staatz, John S.	Agricultural Economics	Zabadal, Thomas J.	Horticulture
Steffe, James F.	Agricultural Engineering	Zabik, Mary E.	Food Science and Human Nutrition
Steffe, James F.	Food Science and Human Nutrition	Zabik, Matthew J.	Entomology
Stehr, Frederick W.	Entomology	Zabik, Matthew J.	Pesticide Research Center
Sternquist, Brenda J.	Human Environment and Design	Zandstra, Bernard H.	Horticulture
Stevens, James A.	Forestry	Zanella, Adroaldo	Animal Science
Strasburg, Gale M.	Food Science and Human Nutrition	Zile, Maija H.	Food Science and Human Nutrition
Straw, Barbara	Large Animal Clinical Sciences	Zipser, Birgit	Physiology
Stynes, Daniel J.	Park, Recreation and Tourism Resources		
Surbrook, Truman C.	Agricultural Engineering		
Swinton, Scott M.	Agricultural Economics		
Tempelman, Robert	Animal Science		
Thiem, Suzanne	Entomology		
Thomashow, Michael F.	Microbiology		
Thomashow, Michael F.	Crop and Soil Sciences		
Tiedje, James M.	Microbiology		
Tiedje, James M.	Crop and Soil Sciences		
Triezenberg, Steven J.	Biochemistry		
Trottier, Nathalie	Animal Science		
Tucker, H. Allen	Animal Science		
Uebersax, Mark A.	Food Science and Human Nutrition		
Ustunol, Zeynep	Food Science and Human Nutrition		
Van Ee, Gary R.	Agricultural Engineering		
van Ravenswaay, Eileen O.	Agricultural Economics		
VandeHaar, Michael	Animal Science		
Vander Stoep, Gail A.	Park, Recreation and Tourism Resources		
Vargas, Joseph M., Jr.	Botany and Plant Pathology		
Velicer, Leland F.	Microbiology		
Vitosh, Maurice L.	Crop and Soil Sciences		
Walker, Edward D.	Entomology		
Walker, Rosemary A.	Family and Child Ecology		
Wang, John L.	Biochemistry		
Ward, Richard W.	Crop and Soil Sciences		
Warncke, Darryl D.	Crop and Soil Sciences		
Watson, J. Throck	Biochemistry		



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# MAES Scientists and Projects by Department

The names listed here represent faculty members who have an MAES appointment and are in the tenure stream as of 10-1-96. Faculty members with dual MAES appointments are listed in both of the departments in which they serve.

SCIENTISTS	PROJECTS
MAES = Michigan Agricultural Experiment Station	Projects listed are as of 10-1-96.
MSUE = Michigan State University Extension	*Signifies Regional Research Project
Joint = Joint appointment in an MAES-affiliated College or Department	
12 = Professor	
13 = Associate Professor	
14 = Assistant Professor	

## Agricultural and Extension Education

Phone: 355-6580



Kirk L. Heinze, Acting Chair

FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Heinze, Kirk L.	13	0.2	0	0	0.8	Communication
Levine, S. Joseph	12	0.2	0.5	0	0.3	Faculty Development
Whims, Fred R.	12	0.12	0.4	0	0.48	Extension Education/Rural Education
<b>TOTALS:</b>		<b>0.52</b>	<b>0.9</b>	<b>0</b>	<b>1.58</b>	

### PROJECTS

- |            |   |            |
|------------|---|------------|
| MICL01752* | The Adoption of Sustainable Farming Systems: Implications to Agricultural Education | Levine, J. |
| MICL03314  | Educational Perspectives of Agricultural Researchers and Scientists                 | Levine, J. |
| MICL03316  | Assessing Retailer/Consumer Perceptions and Use of Michigan-Produced Commodities    | Heinze, K. |

## Agricultural Economics

Phone: 355-4563



Larry G. Hamm, Chair

FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Batie, Sandra S. <sup>1</sup>	12	0.6	0.2	0	0.2	Food and Agriculture Policy
Black, J. Roy	12	0.8	0	0	0.2	Farm Management
Crawford, Eric W.	12	0.4	0.35	0	0.25	International Development
Eicher, Carl K.	12	0.5	0	0	0.5	International Development
Ferris, John N.	12	0.2	0.65	0	0.15	Outlook & Prices
Hanson, Steven D.	13	0.8	0	0	0.2	Agricultural Finance

# Agricultural Economics

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Harsh, Stephen B.	12	0.2	0.65	0	0.15	Farm Management
Hoehn, John P.	12	0.7	0	0	0.3	Resource Development
Koontz, Stephen R.	14	0.75	0	0	0.25	Livestock Industry Marketing
Lloyd, James W.	13	0.2	0	0	0.8	Livestock Production/Health Management/Food Safety
Martin, Laura L.	14	0.5	0.5	0	0	Livestock Industry Management
Myers, Robert S.	13	0.8	0	0	0.2	International Trade & Price Analysis
Norris, Patricia E.	14	0.12	0.3	0	0.58	Land Use Management/Public Resource Economics
Oehmke, James F.	13	0.75	0	0	0.25	Price Analysis & Research Policy
Peterson, H. Christopher	13	0.18	0	0	0.82	Agribusiness
Ricks, Donald J.	12	0.2	0.7	0	0.1	Marketing
Robison, Lindon J.	12	0.65	0	0	0.35	Production Economics
Rochin, Refugio L.	12	0.18	0	0	0.82	International Rural & Community Development/Ethnic Minority Groups
Schmid, A. Allan	12	0.6	0	0	0.4	Land Economics/Public Policy
Schwab, Gerald D.	12	0.15	0.5	0	0.35	Farm Management
Schweikhhardt, David B.	13	0.25	0.4	0	0.35	Agricultural Trade Policy
Shaffer, James D.	12	0.7	0	0	0.3	Marketing/Agricultural Policy
Staatz, John S.	12	0.25	0	0	0.75	International Development
Swinton, Scott M.	14	0.7	0	0	0.3	Production Economics
van Ravenswaay, Eileen O.	12	0.75	0	0	0.25	Public Policy/Food Safety
Weber, Michael T.	12	0.8	0	0	0.2	International Development
<b>TOTALS:</b>		<b>12.73</b>	<b>4.25</b>	<b>0</b>	<b>9.02</b>	

## PROJECTS

MICL01502	The Performance of Coordinating Functions and Institutions of the U.S. Food System	Staatz, J.
MICL01518*	Benefits and Costs in Natural Resource Planning	Hoehn, J.
MICL01519*	Private Strategies, Public Policies and Food System Performance	van Ravenswaay, E.
MICL01530*	Economic Issues Affecting the U.S. Fruit and Vegetable System	Ricks, D.
MICL01576*	Farm Information Systems	Harsh, S.
MICL01625	Financial Decision Making and Investment in Agriculture	Hanson, S.
MICL01635	Collective Action in Agriculture, Natural Resources and Rural Development	Schmid, A.
MICL01650	Effects of Macroeconomic Fluctuations and Government Stabilization Policies on U.S. Agriculture	Myers, R.
MICL01660*	Regulatory, Efficiency and Management Issues Affecting Rural Financial Markets	Hanson, S.
MICL01666*	Impact Analyses and Decision Strategies for Agricultural Research	Oehmke, J.
MICL01669	Developing Econometric Models for the Agricultural and Food Sectors	Ferris, J.
MICL01682	Application of Present Value Techniques for Financing, Design and Selection of Durables	Robison, L.
MICL01690	Livestock Health Management Economics and the Safety of Animal-Origin Foods	Lloyd, J.
MICL01702	Economic Institutions, Organizational Behavior and Food Systems Performance	Shaffer, J.
MICL01709	Assessment of Policies for Improving Environmental Quality	Graham-Tomasi, T.
MICL01712	Agricultural Production Economics and Environmental Risk Management	Swinton, S.
MICL01713	Agribusiness Competitiveness and Management Strategies	Peterson, H.
MICL01721	Global Agribusiness Marketing Research for Michigan Food and Agribusiness Industries	Yumkella, K.
MICL01732	National and International Agricultural Policies and Policy Decision Processes	Schweikhhardt, D.

# Agricultural Economics

(continued)

MICL01737	Changing Private and Public Roles in Technology Development, Technology Transfer and Seed Distribution	Eicher, C.
MICL01744	Agricultural Economics Research on International Agricultural Development and Environmental Issues	Eicher, C.
MICL01770	Economic Analysis of Public Policies Affecting the Performance of Michigan Agriculture	Batie, S.
MICL01788	Economic Analysis of Tactical and Operational Decisions on Farms and Design/Development of Info Systems	Harsh, S.
MICL01790	Structural Adjustments in Michigan's Pork and Beef Sectors	Black, J.
MICL03333	Improved Marketing and Marketing Systems for Fruits and Vegetables	Ricks, D.
MICL08150	Modifying Contracts in Agriculture to Achieve Nonpoint Pollution Control	Batie, S.
MICL08153	Rural <i>Colonias</i> in the Southwest: Conditions and Implications	Rochin, R.
MICL08157	The Economic and Environmental Impacts of Industrialization in the U.S. Pork Industry	Myers, R.

# Agricultural Engineering

Phone: 355-4720

Robert D. von Bernuth,  
Chair

FACULTY		RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bakker-Arkema, Fred W.		12	0.65	0	0	0.35	Grain Dry Storage
Berglund, Kris A.		12	0.49	0	0	0.51	Biotechnology/Food Engineering
Bickert, William G.		12	0.2	0.8	0	0	Livestock Facilities/Environment
Brook, Roger C.		12	0.25	0.75	0	0	Postharvest Handling, Storage, Drying
Burkhardt, Thomas H.		12	0.25	0	0	0.75	Construction Systems & Project Scheduling
Gerrish, John B.		12	0.4	0	0	0.6	Electronic Robotics
Guyer, Daniel E.		13	0.25	0.75	0	0	Fruit/Vegetable Storage/Handling
Loudon, Theodore L.		12	0.3	0.7	0	0	Pollution Management/Irrigation
Merva, George E.		12	0.45	0	0	0.55	Irrigation/Drainage
Person, Howard L.		13	0.3	0.7	0	0	Agricultural Structures/Livestock
Segerlind, Larry J.		12	0.35	0	0	0.65	Finite Element Analysis
Srivastava, Ajit K.		12	0.5	0	0	0.5	Power & Machine Systems/Hydraulics
Steffe, James F.		12	0.35	0	0	0.65	Food Engineering/Rheology
Surbrook, Truman C.		12	0.25	0	0	0.75	Electrical Technology
Van Ee, Gary R.		12	0.65	0	0	0.35	Chemical Application/Power & Machinery
Wilkinson, Robert H.		13	0.15	0.6	0	0.25	Human Factors Engineering/Chemical Application
<b>TOTALS:</b>			<b>5.79</b>	<b>4.3</b>	<b>0</b>	<b>5.91</b>	

## PROJECTS

MICL01245*	Improvement of Thermal Processes for Foods	Steffe, J.
MICL01579	Development of Machine Concepts for Mechanized Agriculture	Ledebuhr, R.
MICL01581	Value-Added Quality Control Techniques in the Postharvest Stages of Fruit and Vegetable Products	Guyer, D.

# Agricultural Engineering

(continued)

MICL01591*	Microirrigation: Management Practices to Sustain Water Quality and Agricultural Productivity	von Bernuth, R.
MICL01676*	Technology and Principles for Assessing and Retaining Quality of Fruits and Vegetables	Srivastava, A.
MICL01695*	Integrated Systems for Improved Water and Nitrogen Management in Irrigation Environments	Loudon, T.
MICL01704	Computational Methods in Food and Agricultural Engineering	Segerlind, L.
MICL01726	Laser Spectroscopy for Analysis of Crystallization Processes	Berglund, K.
MICL01738*	Marketing and Delivery of Quality Cereals and Oilseeds	Bakker-Arkema, F.
MICL01767	Development of Chemical Application Technology for Agribusiness	Van Ee, G.
MICL01777	Engineering for Food Quality and Safety	Brook, R.
MICL01784	Marketing and Delivery of Quality Cereals and Oilseeds	Bakker-Arkema, F.
MICL01787	Improvement of Small-Scale Decentralized and Onsite Wastewater Treatment and Disposal	Loudon, T.
MICL01793	Dimensional Analysis and Scale Modeling in Biosystems Engineering	Srivastava, A.
MICL01794	Analysis and Characterization of Biosystems	Gerrish, J.
MICL03329	Electrical Power and Control Applications in Agriculture	Surbrook, T.
MICL03344	Alternative Systems Development for Sustainable Pasture Rearing of Swine in an Intensive Land Use Environment	Person, H.
MICL03353	Irrigation Methodology to Control Runoff	Merva, G.
MICL07595	Water Quality Impacts of Water Table Management	Belcher, H.

## Animal Science

Phone: 355-8383

Maynard G. Hogberg,  
Chair

FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Allen, Michael	13	0.5	0.5	0	0	Forage Nutrition
Aulerich, Richard J.	12	0.75	0.25	0	0	Fur-bearing Animals/Nutrition/Toxicology
Balander, Richard J.	12	0.4	0	0	0.6	Avian Physiology/Reproduction
Banks, Bobby D.	13	0.25	0	0	0.75	Animal Genetics
Bates, Ronald O.	14	0.2	0.8	0	0	Swine Genetics/Management
Beede, David <sup>5</sup>	12	0.5	0.35	0	0.15	Dairy Nutrition/Dairy Management
Benson, Margaret	12	0.2	0.5	0	0.3	Ruminant Nutrition/Sheep
Bucholtz, Herbert F.	12	0.15	0.7	0	0.15	Dairy Nutrition/Management
Bursian, Steven	12	0.85	0	0	0.15	Avian Physiology/Toxicology
Burton, Jeanne L.	14	0.8	0	0	0.2	Molecular Genetics/Dairy Cattle
Buskirk, Daniel	14	0.5	0.5	0	0	Ruminant Nutrition/Beef

# Animal Science

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Chou, Karen	13	0.8	0	0	0.2	Toxicology
Coe, Paul H.	13	0.2	0	0	0.8	Animal Health
Cook, Robert M.	12	0.8	0	0	0.2	Ruminant Nutrition
Coussens, Paul M.	13	0.8	0	0	0.2	Molecular Biology
Doumit, Matthew E.	14	0.25	0	0	0.75	Meat Science/Muscle Biology
Dukelow, W. Richard	12	0.25	0	0	0.75	Reproductive Physiology
Ferris, Theodore A.	12	0.2	0.8	0	0	Dairy Genetics
Fogwell, Ralph L.	12	0.3	0.5	0	0.2	Physiology
Hawkins, David R.	12	0.15	0	0	0.85	Beef Cattle Nutrition/Management
Hill, Gretchen M.	12	0.85	0	0	0.15	Swine Nutrition
Ireland, James J.	12	0.95	0	0	0.05	Physiology
Mao, Ivan Ling	12	0.95	0	0	0.05	Dairy Genetics
Nielsen, Brian D.	14	0.6	0	0	0.4	Equine Exercise Physiology
Orth, Michael	14	0.8	0	0	0.2	Turkey Nutrition/Growth Biology
Osburn, Wesley N.	14	0.25	0	0	0.75	Meat Science
Ritchie, Harlan D.	12	0.1	0.9	0	0	Beef Cattle Nutrition/Management
Rozeboom, Dale	14	0.15	0.7	0	0.15	Swine Nutrition/Management
Rust, Steven	12	0.5	0.5	0	0	Beef Feedlot Nutrition
Tempelman, Robert	13	0.5	0	0	0.5	Statistics
Trottier, Nathalie	14	0.4	0	0	0.6	Swine Nutrition/Management
Tucker, H. Allen	12	0.85	0	0	0.15	Physiology/Lactation
VandeHaar, Michael	14	0.65	0	0	0.35	Dairy Nutrition
Yokoyama, Melvin T.	12	0.85	0	0	0.15	Animal Nutrition/Microbiology
Zanella, Adroaldo	14	0.75	0	0	0.25	Ethology/Stress Physiology
<b>TOTALS:</b>	<b>18</b>	<b>7</b>	<b>0</b>	<b>10</b>		

## PROJECTS

MICL00859	Hormonal Control of Reproduction in Cattle, Sheep and Swine	Dukelow, W.
MICL01039	Fur Animal Studies (Mink)	Aulerich, R.
MICL01156*	Dairy Herd Management Strategies for Improved Decision Making and Profitability	Skidmore, A.
MICL01163	Factors Controlling Growth and Lactation	Tucker, H.
MICL01178	Breeding Strategies to Maximize Economic Gain in Dairy Cattle Production	Mao, I.
MICL01182*	Molecular Mechanisms Regulating Skeletal Muscle Growth and Differentiation	Bergen, W.
MICL01196*	Methods for Improvement of Fertility in Cows Postpartum	Fogwell, R.
MICL01318	Utilization of Fiber by Ruminants	Cook, R.
MICL01521*	Metabolic Relationships in Supply of Nutrients for Lactating Cows	Emery, R.
MICL01573	Development of Chimeric Antigens as Vaccines to Regulate Fertility	Ireland, J.
MICL01575*	Increased Efficiency of Sheep Production	Benson, M.
MICL01604	Increasing Efficiency of Protein Production in Dairy Cattle	VandeHaar, M.
MICL01622	Environmental Chemical Influences on Reproduction	Chou, K.
MICL01643	Microbial Ecology of the Rumen, Gastrointestinal Tract, Ensiled Feeds and Livestock	Yokoyama, M.
MICL01652*	Environmental and Economic Impacts of Nutrient Flows in Dairy Forage Systems	Allen, M.
MICL01675	Molecular Characterization of Marek's Disease Virus (MDV)	Coussens, P.
MICL01691*	Genetic Improvement of Dairy Cattle Using Molecular Markers	Ferris, T.
MICL01725	Maximum Utilization of Michigan Grown Feedstuffs for Growing-Finishing Cattle	Rust, S.

# *Animal Science*

(continued)

MICL01727	The Fate and Biological Effects of Xenobiotics in Animals	Bursian, S.
MICL01747	Increasing Milk Solids Secretion	Emery, R.
MICL01760	Effects of Specific Nutrients on Health and Productivity of Swine	Hill, G.
MICL03047	Feeding and Management Regimes for Efficient Utilization of Michigan Feedstuffs by Beef Cattle	Ritchie, H.
MICL03340	Nutrition and Feeding Management for Michigan Dairy Herds	Bucholtz, H.
MICL03341	Corpora Lutea and Reproduction in Lactating Dairy Cows	Fogwell, R.
MICL03342	Dairy Herd Management Strategies for Improved Profitability and Productivity	Skidmore, A.
MICL06872	Energy Balance, Insulin-Like Growth Factor I and Reproductive Health	VandeHaar, M.
MICL06880	Oncogenic Alphaherpesvirus Gene Expression	Coussens, P.
MICL06883	The Use of Propionibacterium for Prevention of Lactic Acidosis	Rust, S.
MICL08133	Aminergic Regulation of Growth Hormone Secretion in Cattle	Tucker, H.
MICL08146	Effects of Inhibins and Their Subunits on Gonadal Function in Heifers	Ireland, J.
MICL08152	Interactions Between MDV and ALV: Transactivation II	Coussens, P.
MICL08168	MDV Replication: Factors Critical to Origin Function	Coussens, P.

## *Biochemistry*

Phone: 353-0804



PHOTO: JOANNE WHALLON



William L. Smith, Chair

**FACULTY**

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Burton, Zachary F.	13	0.2	0	0	0.8	Molecular Biology
Fraker, Pamela J.	12	0.44	0	0	0.56	Immunology
Gage, Douglas A.	14	0.2	0	0	0.8	Plant Biochemistry
Hausinger, Robert P.	12	0.25	0	0	0.75	Enzymology
Kaguni, Jon M.	12	0.58	0	0	0.42	Molecular Biology
Kindel, Paul K.	12	0.6	0	0	0.4	Plant Biochemistry
Kroos, Lee R.	13	0.56	0	0	0.44	Molecular Biology
McGroarty, Estelle J.	12	0.33	0	0	0.67	Lipid/Protein Biochemistry
Preiss, Jack	12	0.25	0	0	0.75	Plant Biochemistry
Schindler, Melvin S.	12	0.35	0	0	0.65	Cell Biology
Triezenberg, Steven J.	12	0.16	0	0	0.84	Molecular Biology
Wang, John L.	12	0.2	0	0	0.8	Cell Biology
Watson, J. Throck	12	0.5	0	0	0.5	Analytical Biochemistry
<b>TOTALS:</b>		<b>4.62</b>	<b>0</b>	<b>0</b>	<b>8.38</b>	

# Biochemistry

(continued)

**PROJECTS**

MICL01223	The Interrelationships Between Dietary Zinc Status and Immune Function	Fraker, P.
MICL01290*	Regulation of Photosynthetic Processes	Preiss, J.
MICL01598	Gene Regulation During Development of Soil Bacteria	Kroos, L.
MICL01601	DNA Replication and Its Regulation in <i>Escherichia coli</i>	Kaguni, J.
MICL01608	Activation of Gene Expression by a Herpes Simplex Virion Protein	Triezenberg, S.
MICL01610	Transcription Factors That Bind to RNA Polymerase II	Burton, Z.
MICL01614	Interaction of Rhizobium with Soybean Cells	Wang, J.
MICL01668	Detection and Characterization of Two Different Structural Types of Pectic Polysaccharides in Plants	Kindel, P.
MICL01683	Control of Lipopolysaccharide Synthesis in <i>Pseudomonas</i> Species by Alginate Regulatory Genes	McGroarty, E.
MICL01754	Protein Structure Elucidation Using MALDI-Mass Spectrometry	Watson, J.
MICL01781	Mechanism of Aluminum Toxicity — Optical Trap Measurements of Cytoskeletal Dysfunction in Living Cells	Schindler, M.
MICL08162	Branching Enzyme and Starch Synthase Isoforms in Starch Synthesis	Preiss, J.

# Botany and Plant Pathology

Phone: 355-4683



Gustaaf A. de Zoeten,  
Chair

**FACULTY**

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Adams, Gerard C.	13	0.55	0.27	0	0.18	Plant Pathology/Mycology
Allison, Richard F.	13	0.75	0	0	0.25	Molecular Virology
Fulbright, Dennis W	12	1	0	0	0	Plant Pathology/Plant Pathogen Genetics
Hammerschmidt, Raymond	12	0.9	0	0	0.1	Plant Pathology/Host-Parasite Interactions Biochemistry
Hart, L. Patrick	12	0.5	0.5	0	0	Plant Pathology/Field Crops
Hausbeck, Mary K.	14	0.39	0.61	0	0	Plant Pathology/Ornamentals, Vegetables & Greenhouse Crops
Jarosz, Andrew M.	14	0.75	0	0	0.25	Plant Pathology/Pathogen Epidemiology
Jones, Alan L.	12	0.5	0.5	0	0	Plant Pathology/Fruit Tree Crops
Ohlrogge, John B.	12	0.84	0	0	0.16	Plant Physiology/Biochemistry & Molecular Biology
Ramsdell, Donald C.	12	0.5	0.5	0	0	Plant Pathology/Fruit Crop Virology
Safir, Gene R.	12	0.9	0	0	0.1	Plant Pathology/Mycorrhizal Fungi

# Botany and Plant Pathology

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Sears, Barbara B.	12	0.25	0	0	0.75	Molecular Genetics
Vargas, Joseph M., Jr.	12	0.26	0.49	0	0.25	Plant Pathology/Sod & Turf Diseases
<b>TOTALS:</b>		<b>8.09</b>	<b>2.87</b>	<b>0</b>	<b>2.04</b>	

## PROJECTS

MICL01206*	Biocontrol of Soilborne Plant Pathogens	Safir, G.
MICL01259*	<i>Fusarium</i> Mycotoxins in Cereal Grains	Hart, L.
MICL01408*	Biological Improvement of Chestnut and Management of the Chestnut Blight Fungus	Fulbright, D.
MICL01491	Molecular Evolution, Systematics and Population Biology of Pathogenic Fungi	Adams, G.
MICL01499	Environmental and Chemical Determinants of VA Mycorrhizal Root Colonization	Safir, G.
MICL01533	Genetic Engineering of Oilseed Crops	Ohlrogge, J.
MICL01562	Physiology of Resistance and Induced Resistance to Disease in Potato	Hammerschmidt, R.
MICL01655	Molecular Analysis of the Aphid Transmission of Pea Enation Mosaic	de Zoeten, G.
MICL01662	Virulence Inhibition Factors and Their Effects on Plant Pathogen Populations	Fulbright, D.
MICL01671	Tissue Culture and Molecular Biology Techniques for the Study of Plant-Pathogenic Organisms	Sears, B.
MICL01673	Biology and Control of the Fungi That Cause Diseases of Field Crops	Hart, L.
MICL01679	Plastome Mutator of Oenothera	Sears, B.
MICL01703	Pathogen Population Biology as a Tool in Developing IPM Strategies	Jarosz, A.
MICL01711	Development and Testing of Molecular Probes for Detection of Pathogens in Symptomless Conifers	Adams, G.
MICL01718	Diseases of Upland Vegetables, Greenhouse Ornamentals and Vegetable Transplants and Their Control	Hausbeck, M.
MICL01756*	Multidisciplinary Evaluation of New Apple Cultivars	Jones, A.
MICL03183	Diseases of Tree Fruit Crops and Their Control	Jones, A.
MICL03315	Etiology, Epidemiology and Control of Fungal Diseases of Small Fruit	Ramsdell, D.
MICL03317	Management of Turfgrass Diseases	Vargas, J.
MICL08140	Control of Thiabendazole Resistant <i>Fusarium sambucinum</i> Causing Dry Rot of Potato	Jarosz, A.
MICL08141	Detection Methods for <i>Erwinia amylovora</i> for Use in Sanitation and Breeding Programs	Jones, A.
MICL08167	Recombination Between Viral RNA and Transgenic Plant Transcripts	Allison, R.

# Chemical Engineering

Phone: 355-5135

## PROJECTS

MICL07602	Bioprocessing for Utilization of Agricultural Raw Materials	Berglund, K.
MICL08136	Catalytic Upgrading of Lactic Acid	Miller, D.

# Chemistry

Phone: 355-9715

## PROJECTS

MICL08160	Environmentally Compatible Synthesis of Value-Added Chemicals From D-Glucose	Frost, J.
MICL08172	Charge Separation and Stabilization in Chloroplast Photosystem II	Babcock, G.

# Crop and Soil Sciences

Phone: 355-0271



## FACULTY



Boyd G. Ellis, Chair

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Anderson, Sharon J.	13	0.75	0	0	0.25	Surface Soil Chemistry
Boyd, Stephen A.	12	0.75	0	0	0.25	Organic Chemistry
Christenson, Donald R.	12	0.35	0.5	0	0.15	Fertility/Management
Copeland, Lawrence O.	12	0.15	0.75	0	0.1	Seed Technology
Crum, James L.	13	0.25	0	0	0.75	Soil Class/Genesis/Turfgrass
Dazzo, Frank B.	12	0.1	0	0	0.9	Microbial Ecology
Diers, Brian W.	14	0.75	0	0	0.25	Soybean Breeding/Genetics
Douches, David S.	13	0.9	0	0	0.1	Potato Breeding/Genetics
Foster, Eunice F.	12	0.15	0	0	0.85	Crop Physiology
Freed, Russell D.	12	0.5	0	0	0.5	International Agronomy/Plant Breeding
Harwood, Richard R. <sup>2</sup>	12	0.6	0.2	0	0.2	Sustainable Agriculture
Hesterman, Oran B.	12	0.23	0.62	0	0.15	Alfalfa/Forage Production
Jacobs, Lee W.	12	0.5	0.5	0	0	Waste & Nutrient Management/Soil Conservation
Kells, James J., Jr.	12	0.25	0.6	0	0.15	Weed Science
Kelly, James D.	12	0.75	0	0	0.25	Dry Bean Breeding
Knezek, Bernard D.	12	0.5	0	0	0.5	Micronutrient Waste Utilization
Leep, Richard H.	12	0.35	0.5	0	0.15	Soil Fertility/Forage Management
Lenski, Richard E. <sup>3</sup>	12	0.4	0	0	0.6	Microbial Ecology & Evolutionary Biology
Mokma, Delbert L.	12	0.5	0.15	0	0.35	Soil Classification/Genesis
Moline, Waldimar J.	12	0.25	0.5	0	0.25	Forage Physiology
Paul, Eldor A.	12	0.62	0.14	0	0.24	Soil Microbiology
Penner, Donald	12	0.8	0	0	0.2	Crop Physiology
Pierce, Francis J.	12	0.7	0	0	0.3	Soil Management Systems
Renner, Karen A.	12	0.5	0.5	0	0	Weed Science
Rieke, Paul E.	12	0.35	0.5	0	0.15	Turfgrass Management
Ritchie, Joe T. <sup>4</sup>	12	0	0.5	0.5	0	Soil Physics/Plant Stress
Robertson, G. Phillip	12	0.38	0	0	0.62	Ecosystem Ecology
Rogers, John N. III	14	0.25	0	0	0.75	Turfgrass Management
Schabenberger, Oliver	14	0.4	0	0	0.6	Statistics
Smucker, A.J.M.	12	0.75	0	0	0.25	Soil Biophysics
Thomashow, Michael F.	12	0.76	0	0	0.24	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.6	0	0	0.4	Soil Microbiology

# Crop and Soil Sciences

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Vitosh, Maurice L.	12	0.3	0.7	0	0	Soil Fertilization Management
Ward, Richard W.	13	0.75	0	0	0.25	Wheat Breeding
Warncke, Darryl D.	12	0.5	0.5	0	0	Greenhouse/Vegetable Soil Fertility
<b>TOTALS:</b>		<b>16.64</b>	<b>7.16</b>	<b>0.5</b>	<b>10.70</b>	

**PROJECTS**

MICL00319	Classification, Genesis and Evaluation of Michigan Soils	Mokma, D.
MICL00569	Breeding and Testing Small Grain Cultivars for Michigan	Freed, R.
MICL00908	Fundamental Factors in Cultural and Chemical Weed Control, Weed Competition and Weed Life Cycles	Renner, K.
MICL01103	Adsorption, Transformation and Release of Inorganic Nutrients by Soils	Ellis, B.
MICL01124	Efficient Use of Plant Nutrients	Vitosh, M.
MICL01462*	Impact of Accelerated Erosion on Soil Properties and Productivity	Mokma, D.
MICL01471*	Chemistry and Bioavailability of Waste Constituents in Soils	Jacobs, L.
MICL01538	Harvestability and Processing Quality of Sugar Beet Roots	Theurer, J.
MICL01561*	Forage Protein Characterization and Utilization for Cattle	Hesterman, O.
MICL01568	Plant Biotechnology: Molecular Approaches to Improve Environmental Stress Tolerance	Thomashow, M.
MICL01574	Movement and Degradation of Organic Contaminants in Soils	Boyd, S.
MICL01617*	Biological and Ecological Basis for Weed Management Decision Support Systems to Reduce Herbicide Use	Kells, J.
MICL01619*	Environmental and Genotypic Control of Assimilate Allocation in Grain Crops	Smucker, A.
MICL01626	Potato Breeding and Genetics	Douches, D.
MICL01654	Genetic Improvement of Beans ( <i>Phaseolus vulgaris</i> L.) for Yield, Pest Resistance and Food Value	Kelly, J.
MICL01670	Assessment and Simulation of the Water, Nutrient and Agricultural Chemical Dynamics in Field Crop Production	Ritchie, J.
MICL01685	Crop Rotation Effects on Soil Microbial Activity, Nutrient Use Efficiency and Productivity	Harwood, R.
MICL01687	Trace Gas Fluxes in Agricultural Landscapes	Robertson, G.
MICL01692	Evolutionary Ecology of Microbial Populations	Lenski, R.
MICL01714	Enhancing Profitability and Sustainability of Crop Production Systems for Farmers	Hesterman, O.
MICL01717	Soybean Breeding and Genetics	Diers, B.
MICL01761	Weed Management as a Component of Field Crop Production Systems	Kells, J.
MICL01768	Management and Production of Grasses, Legumes and Their Mixtures for Sustainable Forage Crops and Pasture	Moline, W.
MICL01772*	Characterizing Nitrogen Mineralization and Availability in Crop Systems to Protect Water Resources	Vitosh, M.
MICL01779	The Physiology and Biochemistry of Herbicide Action, Selectivity and Degradation	Penner, D.
MICL01780	Impact Absorption, Traction and Wear Tolerance Investigation on Turf and Soil Surfaces	Rogers, J.
MICL01782	Application of Organic and Other Waste Residuals to Agricultural Soils as a Waste Management Option	Jacobs, L.
MICL03122	Development and Correlation of Soil Test Procedures with Crop Yields and Plant Nutrient Contents	Warncke, D.
MICL03128	Systems of Cropping	Christenson, D.
MICL03260	Forage Management Studies in Northern Michigan	Leep, R.
MICL03302	Management of Organic Soils for Crop Production	Warncke, D.
MICL03313	Cultivation and Topdressing Effects on Turf and Soil	Rieke, P.

# Crop and Soil Sciences

(continued)

MICL03319	Wheat Breeding and Genetics	Ward, R.
MICL03324	Strategies of Drought Resistance in Beans ( <i>Phaseolus vulgaris</i> L.)	Foster, E.
MICL03335	Soil Biophysical Mechanisms of Functional Plant Roots in Crops of Agroecosystems	Smucker, A.
MICL03336	Maize Breeding and Production Management	Harpstead, D.
MICL07598	Alfalfa-Grass Intercrops: A Preventative Pest Management System for Weeds and Insects	Hesterman, O.
MICL07600	Improvement of Plant Cold Tolerance	Thomashow, M.
MICL07601	Root Modification of Preferential Flow and Solute Mobility in Subirrigated Agriculture	Smucker, A.
MICL07603	Management Systems for Sustainably Integrating Soil, Plants and Animals	Harwood, R.
MICL07611	Improved Production and Utilization Technology for Michigan Potatoes	Douches, D.
MICL08107	Primsulfuron Sorption, Diffusion and Degradation in Soils — NMR Study	Anderson, S.
MICL08142	Organic N Mineralization and Functional Group Abundance in Clover-Amended Soil	Anderson, S.
MICL08143	Factors Governing the Availability of Pesticides for Biodegradation: Sorption and Aging	Boyd, S.

# Entomology

Phone: 355-4662



J. Mark Scriber, Chair

PHOTO JOHN W. HICKMAN JR.

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Ayers, George S.	12	0.25	0	0	0.75	IPM/Apiculture
Bird, George W.	12	0.2	0.65	0	0.15	Agricultural Nematology
Bristow, Catherine	13	0.3	0	0	0.7	Insect Ecology
Edens, Thomas C.	12	0.2	0	0	0.8	Resource Economics & Policy
Gage, Stuart H.	12	0.5	0.12	0	0.38	Environmental Systems/ Entomological Surveys
Grafius, Edward J.	12	0.2	0.65	0	0.15	Vegetable Insect Ecology Management
Landis, Douglas A.	13	0.66	0.14	0	0.2	Insect Ecology/Biological Control
McCullough, Deborah G.	14	0.3	0.5	0	0.2	Forest Entomology
Melakerberhan, Haddish	14	0.2	0	0	0.8	Plant-Nematode Interaction Physiology
Merritt, Richard W.	12	0.5	0	0	0.5	Aquatic Insect Ecology
Miller, James R.	12	0.24	0	0	0.76	Insect Behavior
Raihel, Alexander S.	12	0.3	0	0	0.7	Insect Physiology
Smitley, David R.	13	0.25	0.6	0	0.15	Landscape/Ornamental Insect Ecology
Stehr, Frederick W.	12	0.37	0	0	0.63	Insect Biocontrol Systems
Thiem, Suzanne	14	0.4	0	0	0.6	Insect Molecular Biology

# Entomology (continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Walker, Edward D.	13	0.33	0.33	0	0.34	Medical/Veterinary Entomology
Whalon, Mark E.	12	0.6	0	0	0.4	Insect Vector Dynamics
Zabik, Matthew J.	12	0.1	0	0	0.9	Environmental Toxicology
<b>TOTALS:</b>		<b>5.9</b>	<b>2.99</b>	<b>0</b>	<b>9.11</b>	

## PROJECTS

MICL01067*	Climate and Agricultural Landscape Productivity Analysis and Assessment in the North Central Region	Gage, S.
MICL01294*	Black Fly Damage Thresholds, Biology and Control	Merritt, R.
MICL01563*	Spatial Dynamics of Leafhopper Pests and Their Management on Alfalfa	Whalon, M.
MICL01584*	Biological and Cultural Management of Plant-Parasitic Nematodes	Bird, G.
MICL01606	Biological Control and Integrated Management of Insects in Nurseries, Turf and the Urban Forest	Smitley, D.
MICL01640*	Ecology and Management of European Corn Borer and Other Stalk-Boring Lepidoptera	Landis, D.
MICL01644	Plant Chemical Defenses: Insect Detoxification and Ecological Factors Affecting Gene Flow and Host Selection/Hybrid Zone	Scriber, J.
MICL01663	Biology and Management of Insect Pests of Vegetable Crops	Grafius, E.
MICL01696	Temporal and Spatial Dynamics of Insects in Diverse Landscapes: A Risk Assessment Perspective	Gage, S.
MICL01698	Development of Arthropod Resistance Management Systems	Whalon, M.
MICL01700	Influence of Gypsy Moth Defoliation on Native Forest Arthropods	McCullough, D.
MICL01710	Ecological Impacts and Management of Forest Insects in Michigan	McCullough, D.
MICL01722*	Ecology and Impact of Gypsy Moth Invasion	Scriber, M.
MICL01733	Mechanisms of Baculovirus Pathogenesis in Insects	Thiem, S.
MICL01734	Diet Choice and Foraging in Ants	Bristow, C.
MICL01741*	Overwinter Survival of Heteroderidae, Pratylenchidae and Associated Nematodes in the North Central Region	Bird, G.
MICL01742	Molecular Basis of Insect Reproduction	Raihel, A.
MICL01745	The Center for the Study of Insect Diversity	Stehr, F.
MICL01783	Influence of Agricultural Landscape Structure on Biological Control of Pests by Insects	Landis, D.
MICL01792	Physiological Basis for Integrated Approach Towards Sustainable Management of Plant-Parasitic Nematodes	Melakeberhan, H.
MICL03269	Using Behavior to Reduce Nontarget Impact of Pesticides	Ayers, G.
MICL03320	Biology and Management of Nematodes Associated with Michigan Agriculture and Natural Resources	Bird, G.
MICL03327	Biology and Control of Biting Flies in Michigan	Merritt, R.
MICL03338	Ecology and Management of Arthropod Vector Populations and Vector-Borne Diseases	Walker, E.
MICL03346	Biology and Management of Tree Fruit Insects	Johnson, J.
MICL07612	Potato/Seed Corn Crop Rotation Systems for Management of Colorado Potato Beetle and Seed Corn Insects	Grafius, E.
MICL08135	A Nematode-Host Physiology Model for Nutrition-Based Management Strategy	Melakeberhan, H.
MICL08138	Genetic Basis of Baculovirus Host-Range Determination	Thiem, S.
MICL08158	Trichogramma Non-Target Impacts: A Model for Biological Control Risk Assessment	Landis, D.
MICL09003	Sustainable Agriculture Research and Education: Facilitation and Transition	Bird, G.

# *Family and Child Ecology*

Phone: 355-7680



Marjorie J. Kostelnik,  
Chair

FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Imig, David R.	12	0.25	0	0	0.75	Family Ecology
Keefe, Dennis R.	14	0.5	0	0	0.5	Family Economics
Keith, Joanne G.	12	0.1	0.8	0	0.1	Human Development/Family
Schiamborg, Lawrence R.	12	0.3	0	0	0.7	Human Development/Family
Walker, Rosemary A.	12	0.5	0	0	0.5	Family Economics
<b>TOTALS:</b>		<b>1.65</b>	<b>0.8</b>	<b>0</b>	<b>2.55</b>	

## PROJECTS

- MICL01523\* Family Business: Interaction in Work and Family Spheres Walker, R.  
 MICL01590\* Housing Transitions of the Maturing Population: Consequences for Rural/Nonmetropolitan Schiamborg, L.  
 Communities  
 MICL01705 Retirement Transitions of the Maturing Population and Consequences for Rural/Urban Schiamborg, L.  
 Communities  
 MICL01786 Determinants of Small Family Business Outcomes Walker, R.  
 MICL03334 Family-Environment and Transactions: Effects on Economic Well-Being and Michigan Keefe, D.  
 Families' Life Quality  
 MICL03349 Types of Family Structure as Related to Michigan Farm-Family-Business Management Practices Imig, D.

# *Fisheries and Wildlife*

Phone: 355-4477



William W. Taylor, Chair



FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bence, James R. <sup>6</sup>	14	0.75	0.2	0	0.05	Fish Population Dynamics
Campa, Henry III	13	0.5	0	0	0.5	Wildlife Habitat Ecology
Coon, Thomas G.	13	0.2	0	0	0.8	Fish Ecology/Stream Management
Garling, Donald L.	12	0.3	0.5	0	0.2	Aquaculture
Giesy, John P.	12	0.55	0	0	0.45	Toxicology
Hayes, Daniel B. <sup>6</sup>	14	0.75	0.2	0	0.05	Stream Fisheries Biology
Liu, Jianguo <sup>6</sup>	14	0.75	0.2	0	0.05	Wildlife Systems Models
McNabb, Clarence D.	12	0.74	0	0	0.26	Limnology
Peyton, R. Benny	12	0.42	0	0	0.58	Human Dimensions
Prince, Harold H.	12	0.75	0	0	0.25	Waterfowl/Wetlands

# Fisheries and Wildlife

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Soranno, Patricia A.	14	0.5	0	0	0.5	Limnology
Winterstein, Scott R.	13	0.5	0	0	0.5	Wildlife Biometry
<b>TOTALS:</b>		<b>6.71</b>	<b>1.1</b>	<b>0</b>	<b>4.19</b>	
<i>Adjustment for PERM Positions</i>		<i>-2.25</i>	<i>-0.6</i>	<i>0</i>	<i>-0.15</i>	
<b>ADJUSTED TOTALS</b>		<b>4.46</b>	<b>0.5</b>	<b>0</b>	<b>4.04</b>	

**PROJECTS**

MICL01414	Fates and Effects of Trace Contaminants in Aquatic Systems	Giesy, J.
MICL01531	Modeling Wildlife Population Dynamics	Winterstein, S.
MICL01540	Ecology, Population Dynamics and Management of Michigan Great Lakes Fisheries Resources	Taylor, W.
MICL01624*	Avian Species in Diverted Farmland	Winterstein, S.
MICL01646	Wildlife Responses to Habitat Management	Campa, H.
MICL01707	Habitat and Its Effects on the Ecology and Management of Fishes	Coon, T.
MICL01716	Environmental and Genetic Components of Reproduction in Bird Populations	Prince, H.
MICL01719	Management of Forests and Wildlife for Multiple Use Benefits	Campa, H.
MICL01739	Improving Public Involvement in Agricultural and Natural Resource Issues	Peyton, R.
MICL01740	Development of Commercial Fish Culture Techniques	Garling, D.
MICL01758	Relationship Between Habitat Characteristics and Fish Population Dynamics	Hayes, D.
MICL01759	Tools and Information for Holistic Management of Great Lakes Fisheries	Bence, J.
MICL01765	Identification of Population Genetic Markers for Fishery Resource Management	Epifanio, J.
MICL01785	Systems Modeling of Wildlife Dynamics Across Heterogeneous Landscapes	Liu, J.
MICL09001	National Coordination for Regional Aquaculture Programs and Activities	Batterson, T.
MICL10003	Regional Aquaculture Center	McNabb, C.
MICL10004	Regional Aquaculture Center	Batterson, T.
MICL10005	North Central Regional Aquaculture Center	Batterson, T.
MICL10006	Regional Aquaculture Center	Batterson, T.
MICL10007	Regional Aquaculture Center	Batterson, T.
MICL10008	Regional Aquaculture Center	Batterson, T.

# Food Science and Human Nutrition

Phone: 355-8474

Mark A. Uebersax,  
Interim Chair**FACULTY**

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bennink, Maurice R.	12	0.5	0	0	0.5	Nutrition
Bond, Jenny T.	12	0.4	0	0	0.6	Nutrition
Booren, Alden M.	12	0.15	0.75	0	0.1	Meat/Poultry/Fish
Bourquin, Leslie D.	14	0.25	0.75	0	0	Food Safety
Cash, Jerry N.	12	0.25	0.75	0	0	Fruit/Vegetable Products
Chenoweth, Wanda L.	12	0.25	0	0	0.75	Nutrition
Doumit, Matthew E.	14	0.25	0	0	0.75	Meat Quality
Helferich, William G.	13	0.65	0	0	0.35	Food Toxicology
Hoerr, Sharon M.	13	0.25	0	0	0.75	Community Nutrition

# Food Science and Human Nutrition

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Linz, John E.	12	0.5	0	0	0.5	Food Microbiology
Ng, Perry K. W.	14	0.5	0	0	0.5	Cereal Science
Ofoli, Robert Y.	13	0.49	0	0	0.51	Heat/Mass Transfer of Biosystems/Food Engineering
Osburn, Wesley N.	14	0.15	0	0	0.85	Meat/Poultry Production
Pestka, James J.	12	0.5	0	0	0.5	Food Microbiology
Price, James F.	12	0.54	0	0	0.46	Meat/Poultry Products
Romsos, Dale R.	12	0.7	0	0	0.3	Lipid Metabolism
Sawyer, Carol A.	13	0.25	0	0	0.75	Food Service Management
Schemmel, Rachelle A.	12	0.3	0	0	0.7	Nutrition
Schroeder, Joseph J.	14	0.5	0	0	0.5	Nutritional Biochemistry/Bioactive Lipids
Smith, Denise M.	12	0.6	0	0	0.4	Poultry/Egg Products
Song, Won O.	13	0.25	0	0	0.75	Nutrition
Steffe, James F.	12	0.25	0	0	0.75	Food Engineering/Rheology
Strasburg, Gale M.	13	0.6	0	0	0.4	Muscle Biochemistry
Uebersax, Mark A.	12	0.6	0	0	0.4	Fruit/Vegetable Products
Ustunol, Zeynep	14	0.5	0	0	0.5	Dairy Foods
Zabik, Mary E.	12	0.19	0	0	0.81	Foods
Zile, Maija H.	12	0.5	0	0	0.5	Nutrition
<b>TOTALS:</b>		<b>10.87</b>	<b>2.25</b>	<b>0</b>	<b>13.88</b>	

## PROJECTS

MICL01193	Factors Affecting Absorption and Utilization of Nutrients	Chenoweth, W.
MICL01209	Quality and Safety of Fresh and Processed Meat Products	Price, J.
MICL01211	Dietary Fat/Carbohydrate Relationships to Selected Health Parameters	Schemmel, R.
MICL01323	Improving Process Efficiency, Product Quality and Nutrient Composition of Fruit and Vegetable Products	Uebersax, M.
MICL01413	Metabolism and Function of Vitamin A	Zile, M.
MICL01419	Processing Treatments Influencing Functional Properties and Utilization of Muscle Foods	Booren, A.
MICL01444*	Health Maintenance Aspects of Dietary Recommendations Designed to Modify Lipid Metabolism	Romsos, D.
MICL01448	Microbial Food-Borne Disease	Pestka, J.
MICL01478*	Genetic Improvement of Beans ( <i>Phaseolus vulgaris</i> L.) for Yield, Pest Resistance and Food Value	Uebersax, M.
MICL01506*	Development of New Processes and Technologies for the Processing of Poultry Products	Smith, D.
MICL01511	Regulation of Cell Development in Filamentous Fungi	Linz, J.
MICL01532*	Functional Properties of Food Proteins	Smith, D.
MICL01597	Food Toxicology and Safety	Helferich, W.
MICL01599	Regulation of Calcium in Muscle Sarcoplasm	Strasburg, G.
MICL01623	Comparative Aspects of Nutrition and Lipid Metabolism	Romsos, D.
MICL01632	Improving the Quality and Safety of Value-Added Meat and Poultry Products	Smith, D.
MICL01649*	Behavioral and Health Factors That Influence the Food Consumption of Young Adults	Hoerr, S.
MICL01664	Manufacturing and Quality of Reduced-Fat and Reduced-Cholesterol Dairy Foods	Ustunol, Z.
MICL01665	Nutritional Status of Individual and Population — Pantothenic Acid Nutriture and Dietary Assessment	Song, W.

# Food Science and Human Nutrition

(continued)

MICL01694*	Nutrient Bioavailability — A Key to Human Nutrition	Chenoweth, W.
MICL01699	Molecular Structure of Soft Wheat Proteins in Relation to End-Use Quality	Ng, P.
MICL01706	Interactions and Surface Phenomena of Colloids and Biopolymers	Ofoli, R.
MICL01715*	Improve Food Safety Through Discovery and Control of Natural and Induced Toxicants and Antitoxicants	Helferich, W.
MICL01723	Assessment of Processes, Formulations and Packaging to Improve Quality and Safety of Dairy Foods	Partridge, J.
MICL01724	Functionality of Ingredients in Baked Products and Food Safety Issues for Michigan Consumers	Zabik, M.
MICL01762	Relationship of Diet and Cancer	Bennink, M.
MICL01764	Quality and Safety of Processed Foods	Gray, J.
MICL01791	Processing and Quality Evaluation of Fruits and Vegetables	Cash, J.
MICL01795	Modulation of Colon and Breast Cancer Cell Growth by Sphingolipids	Schroeder, J.
MICL03221	Processing and Quality Evaluation of Fruits and Vegetables	Cash, J.
MICL03276	Food Industry Institute	Haines, W.
MICL03345	Targeting Michigan Groups at Nutritional/Health Risk	Bond, J.
MICL03348	Food Intake Patterns as Indicators of Diet Quality and Weight Status	Hoerr, S.
MICL03351	Empower Foodservice Workers in Michigan to Handle Food Safely	Sawyer, C.
MICL08128	Characterization of Soft Wheat Proteins in Relation to Cookie-Making Quality	Ng, P.
MICL08144	Effects of Lactic Cultures on Gastrointestinal Immune Function	Pestka, J.
MICL08151	Recombinant Antibodies for Natural Toxicants	Pestka, J.
MICL08156	Metabolism and Function of Retinoic Acid in Quail Embryogenesis	Zile, M.

## Forestry

Phone: 355-0091



### FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Dickmann, Donald I.	12	0.7	0	0	0.3	Tree Physiology
Epperson, Bryan K.	14	0.7	0	0	0.3	Forest Genetics
Fried, Jeremy S.	14	0.6	0	0	0.4	Forest Management
Hart, James B., Jr.	13	0.5	0	0	0.5	Forest Soils
Kamdem, Donatiens-Pascal	14	0.7	0	0	0.3	Wood Science
Kielbaso, Julian J.	12	0.15	0.25	0	0.6	Urban Forestry
Lantagne, Douglas O.	13	0.2	0.8	0	0	Silviculture
Leefers, Larry A.	13	0.5	0	0	0.5	Forest Economics
Manthy, Robert S.	12	0.5	0	0	0.5	Forest Economics



Daniel E. Keathley, Chair

# Forestry

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
McDonough, Maureen H.	12	0.15	0.5	0	0.35	Forest Sociology
Potter-Witter, Karen L.	13	0.55	0.35	0	0.1	Forest Economics
Ramm, Carl W.	13	0.6	0	0	0.4	Forest Biometrics
Stevens, James A.	14	0.5	0.3	0	0.2	Trade Economics
<b>TOTALS:</b>		<b>6.35</b>	<b>2.2</b>	<b>0</b>	<b>4.45</b>	

**PROJECTS**

MICL01048	The Hygroscopic Dimensional Changes of Wood and Wood Products	Suchsland, O.
MICL01148	Evaluation of Natural Control for Gypsy Moth in Southern Michigan	Ramm, C.
MICL01432	Attitudes Toward Natural Resources and the Environment in the 1990s: A Representative Approach	McDonough, M.
MICL01494	Intensive Management for the Regeneration of Conifers and Hardwoods in Michigan	Lantagne, D.
MICL01693*	The National Atmospheric Deposition Program — A Long-Term Monitoring Program in Support of Research of Atmospheric Chemical Deposition	Hart, J.
MICL01748	Economic Evaluation of Forest Management Opportunities: Supply/Demand Modeling of Michigan Stumpage Markets	Potter-Witter, K.
MICL01749	Assessment of Effects of Prescribed Burning on Fine Roots in a Mature Red Pine Stand	Dickmann, D.
MICL01750	Production and Trade Flow of Michigan Forest Products	Stevens, J.
MICL01755	Incorporating GIS Into Bio-Social Analysis for Ecosystem Management	Fried, J.
MICL01773	Testing Lake States TWIGS: Five- and 10-Year Growth Projections for Upland Hardwoods in Northern Lower Michigan	Ramm, C.
MICL01774	Managing the Genetic Diversity of Michigan Pines	Epperson, B.
MICL03331	Soil and Hydrology Relationships of Forested Landscape Ecosystems	Hart, J.
MICL07597	Advanced Technology Applications to Eastern Hardwood Utilization	Suchsland, O.
MICL07607	Advanced Technology Application to Eastern Hardwood Utilization	Suchsland, O.
MICL07609	Advanced Technology Application to Eastern Hardwood Utilization	Suchsland, O.
MICL07615	Advanced Technology Applications to Eastern Hardwood Utilization	Kamdem, D.

# Horticulture

Phone: 355-5191



Wayne H. Loescher, Chair

**FACULTY**

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Beaudry, Randolph M.	13	0.5	0.5	0	0	Postharvest Fruit Physiology
Biernbaum, John A.	13	0.2	0	0	0.8	Plant Physiology/Floriculture
Bukovac, Martin J.	12	0.9	0	0	0.1	Plant Physiology/Pomology
Cameron, Arthur C.	12	0.7	0	0	0.3	Plant Physiology/Landscape Horticulture
Carlson, William H.	12	0.35	0.5	0	0.15	Floriculture/Physiology & Bedding
Dennis, Frank G., Jr.	12	0.4	0	0	0.6	Plant Physiology/Pomology
Dilley, David R.	12	0.8	0	0	0.2	Postharvest Physiology/Pomology
Ewart, Lowell C.	12	0.6	0	0	0.4	Floral/Onion Breeding
Flore, James A.	12	0.65	0	0	0.35	Plant Physiology/Pomology

# Horticulture

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Grumet, Rebecca	13	0.9	0	0	0.1	Vegetable Breeding/Genetics
Hancock, James F.	12	0.9	0	0	0.1	Small Fruit Breeding/Genetics
Hanson, Eric J.	13	0.35	0.65	0	0	Pomology/Small Fruits
Heins, Royal D.	12	0.75	0	0	0.25	Plant Physiology/Floriculture
Herner, Robert C.	12	0.35	0	0	0.65	Postharvest Physiology/ Vegetable Crops
Howell, Gordon S.	12	0.8	0	0	0.2	Plant Physiology/ Viticulture/Enology
Hull, Jerome, Jr.	12	0.2	0.8	0	0	Pomology/Physiology & Culture
Iezzoni, Amy F.	12	0.8	0	0	0.2	Fruit Breeding/Genetics
Kelly, John F.	12	0.66	0.11	0	0.23	Vegetable Composition
Nair, Muraleedharan G.	13	0.9	0	0	0.1	Natural Products/Chemistry
Perry, Ronald L.	12	0.5	0.5	0	0	Pomology/Rootstocks
Schutzki, Robert E.	13	0.1	0	0	0.9	Landscape Horticulture
Sink, Kenneth C.	12	0.75	0	0	0.25	Genetics/Plant Breeding
Widders, Irvin E.	12	0.67	0	0	0.33	Vegetable Physiology
Zabadal, Thomas J.	13	0.5	0.5	0	0	Viticulture
Zandstra, Bernard H.	12	0.25	0.75	0	0	Vegetable Crops
<b>TOTALS:</b>		<b>14.48</b>	<b>4.31</b>	<b>0</b>	<b>6.21</b>	

## PROJECTS

MICL01155*	Postharvest Physiology of Fruits	Dilley, D.
MICL01222*	Plant Germ Plasm and Information Management and Utilization	Iezzoni, A.
MICL01272	Physiology of Carbon Balance in Fruit Crops: Abiotic and Biotic Thresholds	Flore, J.
MICL01305*	Rootstock and Interstem Effects on Pome and Stone Fruit Trees	Perry, R.
MICL01325	Weed Control in Vegetable Crop Management Systems	Zandstra, B.
MICL01428	Sour Cherry and Peach Breeding and Genetics	Iezzoni, A.
MICL01461*	Freeze Damage and Protection of Fruit and Nut Crops	Howell, G.
MICL01468	Role of Ion Flux and Compartmentation in the Transduction of Environmentally Elicited Signals	Widders, I.
MICL01517	Optimization of the Root Zone Environment in Greenhouse Crop Production	Biernbaum, J.
MICL01607	Physiological Adaptation and Cultural Manipulation of Plant Systems	Schutzki, R.
MICL01636	Quality Maintenance of Horticultural Crops During Handling and Storage	Herner, R.
MICL01637	Postharvest Physiology of Fruits	Dilley, D.
MICL01638	Rootstock, Root System and Soil Effects on Fruit Crops Growth and Fruiting	Perry, R.
MICL01680	Biologically Active Natural Products and Value-Added Products From Crops	Nair, M.
MICL01684	Modified Atmosphere Packaging of Horticultural Produce	Cameron, A.
MICL01697*	Controlled Environment and Facilities Engineering for Greenhouses	Heins, R.
MICL01731	Breeding and Genetic Studies for Selected Horticultural Crops	Sink, K.
MICL01743	Chemical Regulation of Plant Growth, Quality and Yield	Ries, S.
MICL01753	Application of Molecular Genetic Approaches to Vegetable Crop Improvement	Grumet, R.
MICL01778	Environmental and Physiological Variables Effect on Growth, Quality and Marketability of Garden Crops	Carlson, W.
MICL03218	Vine Culture and Physiology for Best Yield, Fruit Quality and Adaptation to Environmental Stresses	Howell, G.
MICL03266	Breeding and Genetics of Onions	Ewart, L.
MICL03272	Physiological and Environmental Factors Influencing Growth and Development of Flower Crops	Heins, R.

## Horticulture (continued)

MICL03281	Efficient Use of Fertilizer in Fruit Production	Hanson, E.
MICL03305	Viticultural Practices for Mechanical Pruning and Crop Control of Concord and Niagara Grapevines	Zabadal, T.
MICL03308	Physiological and Genetic Factors Influencing the Content and Bioavailability of Nutrients in Vegetable Crops	Kelly, J.
MICL03309	Controlling Flowering, Fruit Set and Fruit Size in Tree Fruits	Dennis, F.
MICL03310	Preserving Postharvest Quality of Fruits and Vegetables	Beaudry, R.
MICL03311	Development of Tree Fruit Cultural Practices to Improve Fruit Quality and Productivity	Hull, J.
MICL03323	Genetic Improvement of Strawberries and Blueberries	Hancock, J.
MICL07583	Factors Causing Decline of Stone Fruit Trees with Emphasis on Sweet Cherry Under Michigan Conditions	Flore, J.
MICL07606	Safeguarding the Supply of Specialty Crops for Consumers	Flore, J.
MICL08125	Effect of Salinity Stress on Regulation of Mannitol Metabolism	Loescher, W.



## Human Environment and Design

Phone: 355-7712



Linda K. Good, Acting Chair

FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Pysarchik, Dawn	13	0.31	0	0	0.69	Mercantile Management
Slocum, Ann C.	13	0.25	0	0	0.75	Apparel Design & Textiles
Sontag, M. Suzanne	12	0.25	0	0	0.75	Apparel Design & Textiles
Sternquist, Brenda J.	12	0.25	0	0	0.75	Mercantile Management
<b>TOTALS:</b>		<b>1.06</b>	<b>0</b>	<b>0</b>	<b>2.94</b>	

### PROJECTS

MICL01442*	Enhancing Health and Safety Through Personal Protective Equipment	Slocum, A.
MICL01775	Processed Foods in India: Consumer Demand and Distribution Systems	Pysarchik, D.
MICL03326	Proximity of Clothing to Self: Scale Construction, Measurement and Theory Development	Sontag, M.
MICL03328	China: The Distribution of Food and Agricultural Products	Sternquist, B.

# Kellogg Biological Station

Phone: 353-9445



Michael J. Klug, Director

## PROJECTS

MICL08124 Nitrous Oxide and Methane Fluxes in Agricultural Ecosystems

Robertson, G.

# Large Animal Clinical Sciences

Phone: 355-9593



Frederik J. Derksen, Chair

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Baker, John C.	12	0.2	0	0	0.8	Bovine Respiratory Diseases
Erskine, Ronald J.	13	0.25	0.33	0	0.42	Dairy Cattle Mastitis
Gomez-Duran, Charles O.	14	0.5	0.3	0	0.2	Swine Veterinary Medicine
Herdt, Thomas H.	12	0.25	0	0	0.75	Cattle Nutrition & Metabolic Diseases
Holland, Robert E.	13	0.34	0	0	0.66	Bovine Enteric Disease
Kaneene, John B.	12	0.14	0	0	0.86	Epidemiology/Disease Impact
Robinson, Norman E.	12	0.25	0	0	0.75	Respiratory Physiology
Rook, Joseph S.	13	0.4	0.4	0	0.2	Small Ruminant Animals
Sears, Phillip	12	0.35	0.35	0	0.3	Dairy Disease Management
Straw, Barbara	12	0.28	0	0	0.72	Swine Veterinary Medicine
<b>TOTALS:</b>		<b>2.96</b>	<b>1.38</b>	<b>0</b>	<b>5.66</b>	

## PROJECTS

MICL01417\* Bovine Respiratory Diseases: Risk Factors, Pathogens, Diagnosis and Management

Baker, J.

MICL01550 Bovine Respiratory Disease: Risk Factors, Immunology, Pathogenesis and Control

Baker, J.

MICL01674 Airway Disease in the Horse

Robinson, N.

MICL01688\* Resistance to Mastitis in Dairy Cattle

Erskine, R.

MICL01708 Pre-Harvest Food Safety in Dairy Cattle: Reducing Risks Related to Mastitis

Erskine, R.

MICL03354 Implementing Food Safety Through Total Quality Management on Michigan Dairy Farms

Sears, P.

MICL03355 Perinatal Lamb Mortality and Production Issues Associated with Pasture Lambing Systems in Michigan

Rook, J.

MICL06805 Bovine Leukemia in Michigan Dairy Cattle

Kaneene, J.

MICL06855 Infectious Causes of Diarrhea Among Neonatal Farm Animals

Holland, R.

MICL06869 Evaluation of Dairy Reproductive Health Indicators

Lloyd, J.

MICL06873 Cost-Benefit Comparison of Prevention and Therapy for Production Diseases of Dairy Cattle

Bartlett, P.

MICL06875 Neuropeptides Influences on Cartilage and Synovial Metabolism

Caron, J.

MICL06878 Persistent Infection with Bovine Viral Diarrhea Virus (BVDV): Diagnosis, Epidemiology and Control

Baker, J.

# Large Animal Clinical Sciences

(continued)

MICL06879	Is the Dairy Quality Assurance Program Effective in Reducing Drug Residues in Milk?	Kaneene, J.
MICL06881	Testing of a New Tool to Quantitate Cytokine Gene Expression in Swine	Mansfield, L.
MICL07581	Minor Use Animal Drug Program: North Central Region	Holland, R.
MICL07610	Minor Use Animal Drug Program: North Central Region	Holland, R.
MICL08116	Plasma Cholesterol and Corpus Luteum Function in Cows	Herdt, T.
MICL08145	Regional Endothelium-Dependent Responses in Equine Pulmonary Arteries	Robinson, N.

# Mechanical Engineering

Phone: 351-5131

## PROJECTS

MICL08148	Flame Spread Over Wood Fiber and Thermoplastic Composites	Wichman, I.
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# Microbiology

Phone: 355-6463



Jerry B. Dodson, Chair

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bagdasarian, Michael	12	0.39	0	0	0.61	Molecular Biology
Breznak, John A.	12	0.3	0	0	0.7	Microbial Ecology
Champness, Wendy C.	13	0.5	0	0	0.5	Microbial Genetics
Dazzo, Frank B.	12	0.8	0	0	0.2	Microbial Ecology
de Bruijn, Frans J.	12	0.38	0	0	0.62	Molecular Biology
Hausinger, Robert P.	12	0.4	0	0	0.6	Microbial Physiology
Klug, Michael J.	12	0.25	0	0	0.75	Microbial Ecology
Maes, Roger K.	12	0.03	0	0	0.97	Virology
Reddy, C. Adinarayana	12	0.46	0	0	0.54	Microbial Physiology/Ecology
Schmidt, Thomas M.	14	0.4	0	0	0.6	Microbial Ecology
Thomashow, Michael F.	12	0.14	0	0	0.86	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.15	0	0	0.85	Soil Microbiology
Velicer, Leland F.	12	0.3	0	0	0.7	Virology
<b>TOTALS:</b>		<b>4.5</b>	<b>0</b>	<b>0</b>	<b>8.5</b>	

# Microbiology

(continued)

**PROJECTS**

MICL01154*	Prevention and Control of Enteric Diseases of Swine	Maes, R.
MICL01314	Symbiotic Infection of Legume Roots by Nitrogen-Fixing Rhizobium	Dazzo, F.
MICL01481	Biodegradation of (Chloro) Aromatic Compounds	Hausinger, R.
MICL01557	Molecular Genetic Regulation of Streptomyces Antibiotics	Champness, W.
MICL01593*	Advanced Technologies for the Genetic Improvement of Poultry	Dodgson, J.
MICL01628	Identification and Analysis of the Genes of Marek's Disease Herpesvirus and the Proteins They Encode	Velicer, L.
MICL01629	Lignin Degradation by Wood-Rotting Fungi	Reddy, C.
MICL01681	Molecular Basis of Symbiotic Plant-Microbe Interactions	de Bruijn, F.
MICL01689	Degradation of Lignocellulose by Termites and Their Microbial Symbionts	Breznak, J.
MICL01728*	National Animal Genome Research Project	Crittenden, L.
MICL01757	Analysis of Ribosomal RNA Genes and Operons in Microbial Ecology and Evolution	Schmidt, T.
MICL01771	Spatial and Temporal Patterns of C, N and Soil Microbial Communities in Agricultural Soils	Klug, M.
MICL03116	Bacterial Ecology: Xylan Degradation by <i>Cytophaga xylanolytica</i>	Uffen, R.
MICL06874	Epitope Display Vector for Construction of Multivalent Vaccines	Bagdasarian, M.
MICL06877	Identification of Infection-Associated Antigens of <i>Actinobacillus pleuropneumonia</i>	Mulks, M.
MICL08117	Structural and Functional Domains of <i>E. coli</i> Enterotoxin	Bagdasarian, M.
MICL08159	Infectious Mitochondrial Hypovirulence in <i>Cryphonectria parasitica</i>	Bertrand, H.
MICL08161	The Regulation of Herbicide Degrading Operons in Soil Bacteria	Wright, A.
MICL08163	Bioproduction of Carveol and Perillyl Alcohol From Limonene	Oriel, P.
MICL08165	Urease Structures, Mechanism and Inhibition	Hausinger, R.
MICL08166	Inbreeding Depression: Mapping Viability Loci Using a Genetic Linkage Map	Okimoto, R.
MICL08170	Development of Enterotoxin B Subunit as Carrier of Foreign Antigenic Epitopes	Bagdasarian, M.

# Packaging

Phone: 355-9580



Bruce R. Harte, Director

FACULTY	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Downes, Theron W.	12	0.2	0	0	0.8	Packaged Food Quality
Giacin, Jack R.	12	0.59	0	0	0.41	Package Product Interaction
Hernandez, Ruben J.	13	0.25	0	0	0.75	Package Product Interaction
Lee, Julian J. L.	13	0.2	0	0	0.8	CAP/MAP & Protective Packaging
Singh, Sher Paul	13	0.2	0	0	0.8	Distribution/Transport/ Environmental Measuring/ Packaging Dynamics
<b>TOTALS:</b>		<b>1.44</b>	<b>0</b>	<b>0</b>	<b>3.56</b>	

**PROJECTS**

MICL01520	Transport Properties of Polymer Films as Related to Quality and Storage Stability of Packaged Products	Giacin, J.
MICL01672	Consumer Size Modified Atmosphere Packaging of Fresh Produce	Lee, J.
MICL01735	Effect of Packaging on Reducing Physical Damage to Fresh Produce Due to Transport Vibration	Singh, S.
MICL01736	Quality Retention in Packaged Food	Downes, T.
MICL03321	Improving the Quality of Products and Distribution Productivity Through Packaging Innovation	Twede, D.
MICL03322	Mass Interactions in Solid Polymer/Fluid Phase Systems and Their Relation to Product Quality	Hernandez, R.

# Park, Recreation and Tourism Resources

Phone: 353-5190



Joseph D. Fridgen, Chair

FACULTY						
	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Holecek, Donald F.	12	0.75	0.25	0	0	Resource Economics/Tourism
Nelson, Charles M.	14	0.25	0	0	0.75	Natural Resource Management
Propst, Dennis B.	13	0.5	0	0	0.5	Psychology/Planning/Economics
Stynes, Daniel J.	12	0.5	0	0	0.5	System Analysis & Research Methods
Vander Stoep, Gail A.	14	0.25	0.25	0	0.5	Communications/Human Dimensions
<b>TOTALS:</b>		<b>2.25</b>	<b>0.5</b>	<b>0</b>	<b>2.25</b>	

PROJECTS

MICL01677	Predicting Recreation and Tourism Choices	Stynes, D.
MICL01678	Impacts of Recreation and Tourism	Stynes, D.
MICL01763	Influences of Natural Resource Recreation on Land Management in Michigan	Nelson, C.
MICL01766	Social Science and Communications in Outdoor Recreation Resource Management	Vander Stoep, G.
MICL03280	Travel, Tourism and Recreation Resource Center	Holecek, D.
MICL03343	Psychology of Recreation and Tourism	Fridgen, J.
MICL09000	Development and Implementation of Economic Impact Models	Stynes, D.

# Pathology

Phone: 353-9160



Charles D. Mackenzie, Chair

FACULTY						
	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bell, Thomas G.	12	0.25	0	0	0.75	Comparative Pathology/Platelet Function
Harkema, Jack	12	0.31	0	0	0.69	Toxicology
Holland, Margo S.	14	0.3	0	0	0.7	Molecular Pathology
Padgett, George A.	12	0.25	0	0	0.75	Comparative Veterinary Pathology
Patterson, Jon S.	13	0.25	0	0	0.75	Veterinary Pathology/Infectious Disease/Animals
<b>TOTALS:</b>		<b>1.36</b>	<b>0</b>	<b>0</b>	<b>3.64</b>	

# Pathology

(continued)

## PROJECTS

MICL01634	Hematopathology of Line-Bred Livestock	Bell, T.
MICL01651	Genetic Disorders of Livestock	Padgett, G.
MICL01720	Immunohistochemical Diagnosis of Infectious Diseases	Patterson, J.
MICL01776	Effects of Endotoxin and Other Organic Dust Constituents on Airway Mucous Cells	Harkema, J.
MICL06882	Hemorrhagic Disorder in Noncytopathic Type II Bovine Virus Diarrhea Viral Infection	Bell, T.

# Pesticide Research Center

Phone: 353-9430

Robert M. Hollingworth,  
Director

## PROJECTS

MICL01730*	A National Agricultural Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
MICL03330	Environmental Dynamics of Xenobiotics in the Environment and Analytical Methods Development	Zabik, M.
MICL07578	NC Region IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
MICL07604	Minor Use Animal Drug Program — Headquarters	Hollingworth, R.
MICL07613	NC Region IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
MICL07614	Michigan's CSREES NAPIAP Program	Olsen, L.
MICL08134	Causes of Resistance to <i>Bacillus thuringiensis</i> Toxicity in Colorado Potato Beetle	Koller, C.
MICL08155	Orchard Floor Management Systems to Reduce Herbicide Use in Deciduous Tree Fruit Production in NC Region	Edson, C.

# Physiology

Phone: 355-6475



William S. Spielman, Chair

## PROJECTS

MICL01542	Signal Transduction in the Pancreatic Duct System	Hootman, S.
MICL01769	Carbohydrate Recognition in Neuronal Pattern Formation	Zipser, B.

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
DiFonzo, Christina D.	14	0.1	0.4	0	0.5	Field Crop Entomology/Pesticide Education Coordinator
Olsen, Larry G.	13	0.25	0.75	0	0	IPM Coordinator
Zabik, Matthew J.	12	0.84	0	0	0.16	Chemical Fate/Residue Analysis
<b>TOTALS:</b>		<b>1.19</b>	<b>1.15</b>	<b>0</b>	<b>.66</b>	

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Dukelow, W. Richard	12	0.4	0	0	0.6	Reproductive Physiology
Hootman, Seth R.	12	0.5	0	0	0.5	Cellular Physiology
Zipser, Birgit	12	0.47	0	0	0.53	Cell Biology
<b>TOTALS:</b>		<b>1.37</b>	<b>0</b>	<b>0</b>	<b>1.63</b>	

# Plant Research Laboratory (MSU-DOE)

Phone: 353-2270



**Kenneth Keegstra,**  
Director

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
de Bruijn, Frans J.	12	0.38	0	0	0.62	Molecular Biology
<b>TOTALS:</b>		<b>0.38</b>	<b>0</b>	<b>0</b>	<b>0.62</b>	

## PROJECTS

MICL08090	Role of Cell Wall-Degrading Enzymes in Plant Pathogenesis	Walton, J.
MICL08119	Rhizopine Synthesis and Catabolism Genes for the Creation of "Biased Rhizospheres"	de Bruijn, F.
MICL08137	Control of mRNA Stability in Dicotyledonous Plants	Green, P.
MICL08147	Regulation of Leghemoglobin (1B) Gene Expression	de Bruijn, F.
MICL08149	Photoperiodic Control of Gibberellin Metabolism in Long-Day Rosette Plants	Zeevaart, J.
MICL08154	Effects of Engineered Plant Respiration on Growth/Yield and Lowered Temperatures	McIntosh, L.
MICL08169	Analysis of Senescence-Inducible Ribonuclease in Tomato	Green, P.
MICL08171	Genetic and Biochemical Analysis of the Hypersensitive Response in Higher Plants	He, S.

# Remote Sensing (Center for)

Phone: 353-7195

## PROJECTS

MICL03312	Agricultural and Natural Resource Management: Applications of Advanced Information Processing Technology	Bartholic, J.
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# Resource Development

Phone: 355-3421



**Cynthia C. Fridgen, Chair**

## FACULTY

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bingen, R. James	13	0.4	0	0	0.6	International Development
Bronstein, Daniel A.	12	0.4	0	0	0.6	Environmental Policy & Law
Dersch, Eckhart	12	0.25	0.5	0	0.25	Natural Resources Management
Edens, Thomas C.	12	0.55	0	0	0.45	Resource Economics & Policy
Kakela, Peter J.	12	0.8	0	0	0.2	Natural Resources Management
Norris, Patricia E.	14	0.08	0.2	0	0.72	Land Use
Rosenbaum, Rene P.	14	0.4	0	0	0.6	Community Economic Development
Schultink, Gerhardus	12	0.5	0	0	0.5	Natural Resources Management
Witter, Scott G.	13	0.3	0	0	0.7	Natural Resources Management
<b>TOTALS:</b>		<b>3.68</b>	<b>0.7</b>	<b>0</b>	<b>4.62</b>	

# Resource Development

(continued)

**PROJECTS**

MICL01102	Public Policy Regarding Health and Environmental Risks: Assessment, Management and Public Participation	Bronstein, D.
MICL01536	Spatial and Temporal Indicators for Economic Development, Land Use Planning and Environmental Impact	Schultink, G.
MICL03267	Design and Management Alternatives for Sustainable Agriculture and Natural Resource Systems	Edens, T.
MICL03318	Water Resource Protection at the Interface of the Hydrologic Cycle and Cultural Influences	Dersch, E.
MICL03352	Mineral Lands Development, Energy Requirements and Environmental Impacts	Kakela, P.

## Small Animal Clinical Sciences

Phone: 355-6570

**PROJECTS**

MICL06870	Adema Disease and Mechanism of Zinc Absorption in Cattle	Yuzbasiyan-Gurkan, V.
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## Sociology

Phone: 355-6632

Christopher K. Vanderpool,  
Chair**FACULTY**

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bokemeier, Janet L.	12	0.5	0	0	0.5	Farm Family/Labor Markets
Busch, Lawrence M.	12	0.5	0	0	0.5	Agriscience Structure/ Agricultural Research Policy
Harris, Craig K.	13	0.5	0	0	0.5	Sociology of Agriculture
Johnson, Nan E.	12	0.5	0	0	0.5	Demography
Schwarzeweller, Harry K.	12	0.5	0	0	0.5	Sociology of Agriculture
<b>TOTALS:</b>		<b>2.5</b>	<b>0</b>	<b>0</b>	<b>2.5</b>	

**PROJECTS**

MICL01612	Strategic Analysis of Technical Change in Commodity Subsectors	Busch, L.
MICL01620*	The Transformation of Agriculture: Resources, Technologies and Policies	Harris, C.
MICL01642*	Impacts of Structural Change in the Dairy Industry	Schwarzeweller, H.
MICL01751*	Rural Labor Markets in the Global Economy	Bokemeier, J.
MICL03337	Work and Family Issues in Rural Michigan Labor Markets	Bokemeier, J.
MICL03339	Rural Migration, Educational Investments and the Uneven Development of Michigan's Upper Peninsula	Schwarzeweller, H.
MICL03350	Mortality of Michigan Residents: Degree of Rurality and Underlying Cause of Death	Johnson, N.

GRAND TOTALS	MAES	MSUE	GRANT	JOINT
	<b>132.89</b>	<b>43.26</b>	<b>0.5</b>	<b>125.35</b>

<sup>1</sup> Elton Smith Endowed Chair<sup>2</sup> C.S. Mott Distinguished Professor of Sustainable Agriculture<sup>3</sup> Hannah Professor for Microbial Ecology and Plant Sciences<sup>4</sup> Nowlin Professor for Water Research<sup>5</sup> Clinton Meadows Chair<sup>6</sup> Partnerships for Ecosystem Research and Management (PERM)  
Positions with salary funded by the Michigan Department of  
Natural Resources

# MAES Contributors

July 1, 1995 to June 30, 1996

- Abbott Laboratories  
Advanced Seed Technology, Inc.  
Ag Spectrum Company  
AgBio Development, Inc.  
Agency for International Development  
AgrEvo USA Company  
Agri Pro Seeds  
Agricultural Genetics Company, Ltd.  
Agricultural Genetic Research Association, Inc.  
AgriDyne Technologies, Inc. (BioSys)  
Agtrol Chemical Products  
American Floral Endowment  
American Association of Nurserymen  
American Chestnut Foundation  
American Cyanamid Company  
American Express Company  
AMVAC Chemical Corporation  
Amway Corporation  
Aquatrols Corporation of America  
Asgrow Seed Company  
Auxein Corporation  
Ball Seed Company  
BASF Corporation  
Bayer Corporation  
Boise Cascade Corporation  
Bordine Nursery, Ltd.  
Brady Farms, Inc.  
C. Raker & Sons, Inc.  
Calgene, Inc.  
Campbell Soup Company  
Cargill Hybrid Seeds  
Central Soya Company, Inc.  
CERTEC, Inc.  
Chelsea Milling Company  
Chemical Manufacturers Association  
Ciba-Geigy Corporation  
Clackamas Greenhouses  
Clorox Company  
Colorado State University  
Consortium for International Earth Science Information Network  
Coomer Seeds, Inc.  
Cornell University  
Countrymark Cooperative, Inc.  
Dean Foods Vegetable Company  
DOW  
DOW Gardens  
DuPont  
Earthgreen Products, Inc.  
Eastman Kodak Company  
Ecogen, Inc.  
Elf Atochem North America, Inc.  
Eli Lilly & Company  
Elsevier Science, Ltd.  
Emmert's Blueberries, Inc.  
Evenflo Products Company, Inc.  
Farm Foundation  
Federal Cartridge Company  
Federal Express  
Fernlea Group  
FMC Corporation  
Four Star Greenhouse, Inc.  
General Mills, Inc.  
Gerber Companies Foundation  
Gerber Products Company  
Glass Corner Greenhouses, Inc.  
Glei's, Inc.  
Gowan Company

- Great Lakes Fishery Commission  
 Green Leaf Enterprises, Inc.  
 Greenhouse Grower  
 Griffin Corporation  
 Growmark, Inc.  
 Hanson Cold Storage Company  
 Harrington Seeds, Inc.  
 Harris Moran Seed Company  
 Health Science Research Foundation  
 Hemlock Elevator Company  
 Henry Mast Greenhouses, Inc.  
 HNTB Corporation  
 Horticultural Research Institute Endowment Fund  
 Hungnong Seed America, Inc.  
 Hunt Wesson, Inc.  
 HybriTech Seed International, Inc.  
 International Group of National Associations of Manufacturers of Agrochemical Products  
 International Health Institute  
 Iowa State University  
 Ivy Acres, Inc.  
 Jack Brown Produce, Inc.  
 K. W. Zellers & Sons  
 Kalamazoo Valley Plant Growers Co-op  
 Kellogg Company  
 King Milling Company  
 Kirin Brewery Company, Ltd.  
 Knappen Milling Company  
 Kraft General Foods, Inc.  
 Kropf Fruit Company  
 Lakeside States, Inc.  
 Land O'Lakes, Inc.  
 Lebanon Chemical Corporation  
 Lehigh Agricultural & Biological Services, Inc.  
 LIPHATECH, Inc.  
 Louisiana State University  
 Loveland Industries, Inc.  
 M&M Mars  
 Maritz Marketing Research  
 MBG Marketing  
 McDonough, Maureen H.  
 Meiring Greenhouse & Farms  
 Mennel Milling Company  
 Merck & Company, Inc.  
 MFS/York  
 Micandy Garden Greenhouses, Inc.  
 Michigan Agricultural Commodities, Inc.  
 Michigan Agricultural Cooperative Marketing Association, Inc.  
 Michigan Apple Committee



- Michigan Apple Research Committee  
Michigan Asparagus Advisory Board  
Michigan Asparagus Research, Inc.  
Michigan Bean Commission  
Michigan Cherry Committee  
Michigan Corn Marketing Committee  
Michigan Crop Improvement Association  
Michigan Dairy Herd Improvement Association, Inc.  
Michigan Department of Agriculture  
Michigan Department of Education  
Michigan Department of Natural Resources  
Michigan Food Processors Association  
Michigan Forest Resource Alliance  
Michigan Forestry & Park Association  
Michigan Foundation Seed Association, Inc.  
Michigan Fur Breeders Association  
Michigan Peach Sponsors  
Michigan Potato Industry Commission  
Michigan Public Health Institute  
Michigan Soybean Promotion Committee  
Michigan State Horticultural Society  
Michigan State Millers' Association  
Michigan Sugar Company  
Michigan Turfgrass Foundation  
Michigan Vegetable Council, Inc.  
Mid-America Food Processors Association  
Mink Farmers Research Foundation  
Molbak's, Inc.  
Monitor Sugar Company  
Monsanto Company  
Murco  
National Center Forest Health Management  
National Institutes of Health  
National Science Foundation  
National Turfgrass Federation, Inc.  
Natural Product Technologies  
Nature Conservancy  
NatureMark  
Neal Mast & Son Greenhouses, Inc.  
Neogen Corporation  
Nestle Beverage Company  
North American Strawberry Growers Research Foundation, Inc.  
North Central Sustainable Agricultural Research  
Nutrena Feeds  
O.J. Noer Research Foundation, Inc.  
Ohio State University Research Foundation  
Ottawa County Extension Service  
Owens-Illinois, Inc.  
Pace International LP  
Parrish & Heimbecker, Inc.  
Paul Ecke Ranch  
Peppergrove Nursery  
Phoebe W. Haas Charitable Trust  
Pickle Packers International, Inc.  
Pillsbury Company  
Pioneer Hi-Bred International, Inc.  
Plant Genetic Systems (Canada), Inc.  
Post Gardens of Battle Creek, Inc.  
Post Gardens, Inc.  
Ralston Purina Company  
Ray Wiegand's Nursery, Inc.  
Red Cliff Band of Lake Superior Chippewas  
Regal Chemical Company  
ReproVax, Inc.  
Rhône-Poulenc Ag Company  
Ritchie, Joe T.  
Riveridge Produce Marketing Company

Rockefeller Foundation  
 Rohm & Haas Company  
 Ross Laboratories  
 Rutgers University  
 Saginaw County  
 Sandoz Agro, Inc.  
 Sankyo Company, Ltd.  
 SePRO Corporation  
 Sherritt, Inc.  
 Smith Gardens, Inc.  
 Snack Food Association  
 Sonnyside Flowers  
 South Dakota State University  
 South Florida Water Management District  
 Southeast Michigan Council of Governments  
 SportGrass, Inc.  
 Star of the West Milling Company  
 Stewart Seeds, Inc.  
 Swift Greenhouses, Inc.  
 Terra International, Inc.  
 Timbuk Farms, Inc.  
 Toro Company  
 Tropicana Products, Inc.  
 TruGreen ChemLawn  
 Tuscola County  
 Twixwood Nursery  
 Tyron Global Company  
 U.P. Whitetails Association, Inc.  
 U.S. Department of Agriculture  
 U.S. Department of Energy  
 U.S. Department of Interior Bureau of Reclamation  
 U.S. Department of Interior Fisheries & Wildlife Service  
 U.S. Environmental Protection Agency  
 U.S.D.A. Agricultural Research Service  
 U.S.D.A. Cooperative State Research, Education & Extension Service  
 U.S.D.A. Forest Service  
 Uniroyal Chemical Company  
 United Agri Products  
 University of Delaware  
 University of Guelph  
 University of Massachusetts  
 University of Michigan  
 University of Missouri  
 University of Nebraska  
 University of Wisconsin  
 UPS General Service Company  
 Urbana Laboratories  
 Valent U.S.A. Corporation  
 Victorian Chemical Company  
 Viskase Corporation  
 W.R. Grace & Company-Conn.  
 Walters Gardens, Inc.  
 Ward's Natural Science Establishment, Inc.  
 Washington Tree Fruit Research Commission  
 Western Michigan Greenhouse Association  
 Wilbur-Ellis Company  
 Wilfarm L.L.C.  
 Winstrip, Inc.  
 WMC Products, Inc.  
 Zelenka Nursery, Inc.  
 Zeneca, Inc.  
 Zorbit Technologies (Michigan), Inc.

# Futures Magazine

*Futures* is the quarterly magazine of the Michigan Agricultural Experiment Station (though in 1996, Vol. 14, Nos. 1 and 2 were combined into one issue). To receive *Futures* free of charge, write to: Futures Editor, 310 Agriculture Hall, MSU, East Lansing, MI 48824-1039, call 517-432-1555, or e-mail depolo@msue.msu.edu.

## Winter 1996, Vol. 13, No. 4

### Keeping Michigan Livestock Healthy

Animal agriculture accounts for about half of Michigan's agricultural income — almost \$14 billion — and provides more than 56,000 jobs in the state. Animal agriculture affects virtually every county in the state. It includes horse racing, pleasure and sport riding, and turkey operations as well as dairy, beef, swine, lamb and chicken enterprises.

Farmers who raise animals want to offer consumers a quality product, and the quality of the food, wool or riding experience is directly related to the health of the animals. MAES scientists in a number of departments are working on collaborative projects to provide farmers with techniques for keeping their animals healthy and productive. This issue of *Futures* highlights some of the work in this area. The researchers are looking at various aspects of animal health, from emerging diseases to nutrition and housing. Rather than focus only on sick animals, researchers today are integrating the concepts of total quality management into animal care. Everyone involved with animal health is part of the solution and provides answers to the problems. Farmers no longer wait until an animal shows symptoms of a disease and then treat it — prevention is a larger concern, as is keeping animals at peak health and performance levels.

## Spring/Summer 1996, Vol. 14, Nos. 1 and 2

### Safeguarding Animal Health and Michigan's Food

Farmers who raise animals for food are usually trying to juggle the demands of several groups whose wants may not always coincide. To answer public concerns about food safety and quality, many food processing companies have adopted stringent policies requiring minimal chemical inputs. Farmers who don't adhere to these high standards lose access to these lucrative markets. Farmers also want to meet the health needs of their animals. Besides being more susceptible to secondary infections, sick animals cost farmers time and money for treatment, are less productive and may spread disease throughout the farm operation. But when medicine used for treatment remains in the animal as a detectable residue, the farmer is caught between the conflicting demands for safe food and healthy animals.

Recognizing that fit animals produce healthy food, MAES researchers from a range of disciplines are working on collaborative projects to ensure that the state's animals are in top shape and that the food that comes from them is as safe as possible. The winter 1996 issue of *Futures* detailed some of the research on keeping Michigan's animals in good health. In this issue, we reexamine the same topic, this time from a food safety angle. As in the earlier issue, several of the researchers and projects profiled here are funded in part by the Revitalization of Animal Agriculture in Michigan Initiative.

## Fall 1996, Vol. 14, No. 3

### Fighting Disease in Michigan's Plants

When all aspects of production, processing and retail operations are considered, agriculture contributes more than \$30 billion to Michigan's economy. Plant-based agriculture accounts for more than \$11 billion of this total and was responsible for providing more than 125,000 jobs in 1993. More than 70 crops are regularly grown in the state, from potatoes, wheat and apples to tomatoes, chestnuts and dry beans. Each of these crops is susceptible to its own set of diseases.

MAES researchers are investigating both the plants and the pathogens to discover new techniques to control and prevent some of the most damaging and prevalent diseases.

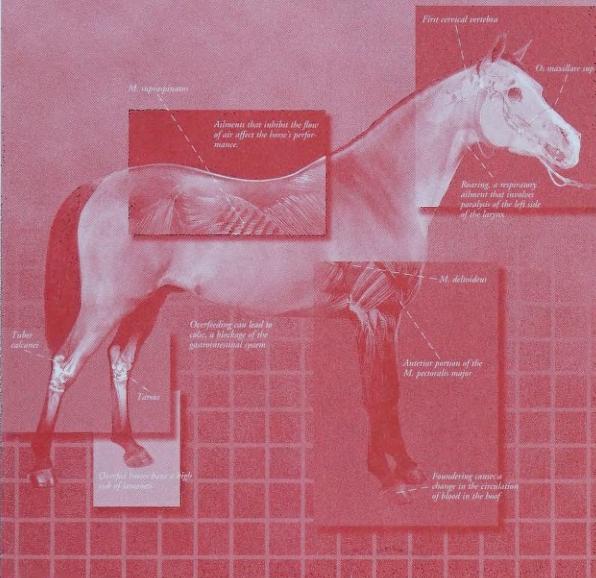
Using new tools based on biotechnology and genetic engineering, the scientists are working to develop new, stronger varieties that are less susceptible to disease. They are also studying whether plants can be "immunized" against disease, much as people are immunized against measles and diphtheria.

In addition to this more basic research, MAES researchers are also working with growers and MSU Extension agents on projects to combat disease problems in the field. This issue of *Futures* highlights several of these projects.

# Futures

WINTER 1996  
VOLUME 13 NUMBER 4  
Michigan State University  
Agricultural Experiment Station

## Keeping Michigan Livestock Healthy



# Futures

FALL 1996  
VOLUME 14 NUMBER 3  
Michigan State University  
Agricultural Experiment Station

## Fighting Disease In Michigan's Plants

# Futures

SPRING/SUMMER 1996  
VOLUME 14 NUMBERS 1 & 2  
Michigan State University  
Agricultural Experiment Station

## Safeguarding Animal Health and Michigan's Food



# Financial Report

July 1, 1995 to June 30, 1996

## DISTRIBUTION OF APPROPRIATED FUNDS



### INCOME:

<b>Federal Appropriations</b>	<b>\$4,899,704</b>
Hatch	\$3,715,796
McIntire-Stennis	\$196,144
Hatch RRF	\$922,767
Hatch Animal Disease Research	\$64,997
<b>State Appropriations</b>	<b>\$27,437,137</b>
<b>TOTAL APPROPRIATIONS:</b>	<b>\$32,336,841</b>
<b>Grants — Federal, State and Private</b>	<b>\$23,301,528</b>

### EXPENSES:

<b>Salaries</b>	<b>\$18,839,504</b>
Fringe Benefits	\$5,899,464
Project Expenses	\$7,597,873
Grants — Federal, State and Private	\$23,301,528

# Personnel

(Full-time Equivalents)

<b>Research Staff*</b>	<b>147.97</b>
Professors	80.73
Associate Professors	29.60
Assistant Professors	14.61
Research Associates and Specialists	23.03

<b>Support Staff</b>	<b>145.81</b>
Administrative Professionals	67.54
Supervisors	25.14
Clerical	43.75
Technicians	9.38

\*Does not include department chairpersons/unit administrators



MICHIGAN AGRICULTURAL EXPERIMENT STATION

J. Ian Gray, Director

109 Agriculture Hall

Michigan State University

East Lansing, Michigan 48824-1039



**SR-90, January 1997**

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